

DIV. OF FISHES

COMMERCIAL FISHERIES REVIEW

1964

MUSEUMS



Vol. 26, NO. 2

FEBRUARY 1964

UNITED STATES DEPARTMENT OF THE INTERIOR
Fish and Wildlife Service
Bureau of Commercial Fisheries
Washington, D.C.

D

C

re

re

B

Pa

Pa

1

1

1

1

1

1

1

1

1

1

UNITED STATES
DEPARTMENT OF THE INTERIOR

STEWART L. UDALL, SECRETARY

FISH AND WILDLIFE SERVICE

CLARENCE F. PAUTZKE, COMMISSIONER

DEPOSITED BY THE
UNITED STATES OF AMERICA

BUREAU OF COMMERCIAL FISHERIES

DONALD L. MCKERNAN, DIRECTOR

DIVISION OF RESOURCE DEVELOPMENT

RALPH C. BAKER, CHIEF



COMMERCIAL FISHERIES REVIEW



A review of developments and news of the fishery industries
prepared in the BUREAU OF COMMERCIAL FISHERIES.

Joseph Pileggi, Editor

G. A. Albano, H. M. Bearse, and H. Beasley, Assistant Editors

Address correspondence and requests to the: Chief, Fishery Market News Service, U. S. Bureau of Commercial Fisheries, Wyatt Bldg., Suite 611, 777 14th Street, NW., Washington, D. C. 20005.

Publication of material from sources outside the Bureau is not an endorsement. The Bureau is not responsible for the accuracy of facts, views, or opinions contained in material from outside sources.

Although the contents of the publication have not been copyrighted and may be reprinted freely, reference to the source is appreciated.

Use of funds for printing this publication has been approved by the Director of the Bureau of the Budget, May 1, 1963.

5/31/68

CONTENTS

Cover: Photograph is from new industry-financed "Fisheries Marketing Bulletin," Can-venient Ways With Shrimp. This four-color publication was a joint effort of the Bureau of Commercial Fisheries and the Gulf Shrimp Cannery Association. National distribution to food editors and others in the field of communicating with the public was made by Bureau Marketing Specialists before and during Lent. (Cover picture--Upper left: Shrimp De Jonghe; Lower left: Shrimp Chowder; Upper right: Shrimp Macaroni Salad; Lower right: Patio Shrimp Plate; for recipes, see p. 6.)

Page
1 .. Utilization of U. S. Otter-Trawl Shrimp Vessels in the Gulf of Mexico, 1959-1961, by Roy L. Lassiter, Jr.

Page	TRENDS AND DEVELOPMENTS:
	Alaska:
7 ..	Major Changes in Commercial Fishing Regulations for 1964
10 ..	Cook Inlet Closed to King Salmon Fishing in 1964
10 ..	Foreign Fishing Efforts Reduced in October 1963
10 ..	University of Alaska Appoints Fishery Extension Course Specialist to Faculty
	Alaska Fishery Investigations:
11 ..	Large Red Salmon Spawning Population Discovered in Naknek River
11 ..	Karluk River Red Salmon Spawning Verified
11 ..	Heavy Fishing Rate Shown on Tagged King Crabs
11 ..	Shrimp Pots in Vertical String Fish Better with Black Mesh
	California:
11 ..	Fishermen's Income, 1962
12 ..	Growth Studies of English Sole and Bottomfish in Monterey Bay
12 ..	Pelagic Fish Population Survey Continued
	Central Pacific Fisheries Investigations:
13 ..	Tuna Studies Continued
	Chesapeake States:
15 ..	Fisheries Landings, 1962

Page	TRENDS AND DEVELOPMENTS (Contd.):
	Films:
16 ..	New Film on Oceanography Produced by U. S. Navy
	Fish Farming:
17 ..	Slat Traps Tested for Harvesting Fish Ponds
	Great Lakes:
17 ..	Fisheries Landings, 1962
	Great Lakes Fisheries Exploration and Gear Research:
17 ..	Trawling Investigations in Northern Lake Michigan and Green Bay Continued
20 ..	Trawl Gear Tested for Catching Lake Herring in Eastern Lake Superior
	Gulf Exploratory Fishery Program:
22 ..	Shrimp Gear Studies Continued
24 ..	Survey of Seasonal Distribution of Royal-Red Shrimp Continued
26 ..	Menhaden off-Season Population Survey
	Gulf Fishery Investigations:
27 ..	Shrimp Distribution Studies
	Gulf States:
28 ..	Fisheries Landings, 1962
	Hawaii:
28 ..	Skipjack Tuna Landings, January-November 1963

Contents continued page II.

CONTENTS (CONTINUED)

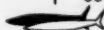
Page	TRENDS AND DEVELOPMENTS (Contd.):
	Hawaii (Contd.):
29 ..	Commercial Fishery Landings, July-June 1962/63 and 1961/62
	Industrial Fishery Products:
30 ..	Trends in Use of Fish Meal in Maine and Massachusetts
30 ..	Upward Trend in Use of Fish Meal in Southern States
	U. S. Fish Meal, Oil, and Solubles:
31 ..	Production by Areas, November 1963
31 ..	Major Indicators for U. S. Supply, November 1963
31 ..	Production, October 1963
	U. S. Fish Meal and Solubles:
32 ..	Production and Imports, January-October 1963
	Inventions:
32 ..	"Bathykymograph" Measures Speed and Depth of Net While Fishing
33 ..	Multi-Immersion Quick Freezer
33 ..	Method of Attaching Fishing Sinkers
33 ..	Fish Holder Patented
	Irradiation Preservation:
33 ..	Preliminary Tests on Oily Fish Indicate Flavor and Storage Problems
	Maryland:
33 ..	Oyster Studies in 1963 Indicate Favorable Conditions for Spawning and Setting
	Michigan:
35 ..	Stocks of Lake Trout Increase Due to Research
	New England Fisheries:
36 ..	Bottomfish and Scallop Landings in 1963 and Forecast for 1964
	North Atlantic Fishery Investigations:
36 ..	Groundfish Distribution and Abundance Studies
	North Atlantic Fisheries Exploration and Gear Research:
37 ..	Tuna Distribution Studies in North Atlantic Continued
	Oceanography:
40 ..	Aquatic Research Institute Established at Stockton, California
	Refrigeration:
42 ..	Technical Symposium on Freezing of Fishery Products
	Sardines:
43 ..	Maine Pack, 1963
	Shrimp:
43 ..	United States Shrimp Supply Indicators, December 1963
44 ..	Postlarval Studies Indicate Possible Value as Index of Adult Population
	Smoked Fish:
44 ..	Status Report on Smoked Fish-Processing Studies Conducted in Great Lakes Region
	South Atlantic Exploratory Fishery Program:
47 ..	Scallop Distribution Survey off Florida
	South Carolina:
47 ..	Fisheries Biological Research Progress, July-December 1963
	Sport Fishing:
50 ..	New Federal Sports Fishing Research Laboratory to be Built on University Property

Page	TRENDS AND DEVELOPMENTS (Contd.):
	Striped Bass:
51 ..	Tag Returns Sought from Long Island Marking Program
	Transportation:
51 ..	Rate Increase Sought by New England Truckers
51 ..	REA Express Files Tariffs to Increase Charges
52 ..	Alaska-Washington Rail-Barge Service Expanded
	Tuna:
52 ..	Results of Bluefin Tagging in Atlantic Ocean by Woods Hole Oceanographic Institution
	U. S. Fishing Vessels:
52 ..	Fisheries Loans and Other Financial Aid for Vessels, October 1-December 31, 1963
53	Documentation Issued and Cancelled:
53 ..	November 1963
54 ..	October 1963
	U. S. Foreign Trade:
54 ..	Imports of Canned Tuna Under Quota
54 ..	Imports of Fish Meal and Scrap by Customs Districts, October 1963
54 ..	Trends in United States Fishery Imports, by Country, 1962
56 ..	Trends in United States Exports of Fishery Products, by Country, 1962
	Wholesale Prices:
57 ..	Edible Fish and Shellfish, December 1963
	FOREIGN:
	International:
	European Fisheries Conference:
59 ..	Meeting Opens in London
	Fish Meal:
59 ..	Production, August-October 1963
	Food and Agriculture Organization:
60 ..	Fishery Products in the World Food Program
61 ..	Twelfth Session of the FAO Conference
	Great Lakes Fishery Commission:
62 ..	Interim Meeting Held in Ottawa
	International Pacific Halibut Commission:
64 ..	North Pacific Halibut Fishing Ended November 30, 1963
	North Pacific Fisheries Commission:
64 ..	Statement by U. S. Delegation Chairman at September Conference in Tokyo
	Norwegian-Soviet Seal Commission:
65 ..	Sixth Session Held in Oslo
	Oceanography:
65 ..	International Investigation of Japanese "Black Current" Planned
	Aden:
66 ..	New Fisheries Research Vessel
	Argentina:
66 ..	Fish Meal Production Estimates Revised
	Brazil:
67 ..	Spiny Lobster Landings and Export Trends
	Canada:
67 ..	Salmon Tagging Program in the Strait of Georgia
	Congo Republic:
68 ..	Freshwater Fisheries Production Drops Sharply
	German Federal Republic:
68 ..	New Research Vessel <u>Meteor II</u>

Contents continued page III.

CONTENTS (CONTINUED)

Page		Page	
	FOREIGN (Contd.):		FOREIGN (Contd.):
	Ghana:		Nicaragua:
68 ..	Fisheries Trends, Third Quarter 1963	77 ..	Spiny Lobster Fishing Regulations Established
68 ..	Fishery Imports Placed Under the Control of State Corporations		Norway:
	Greece:	78 ..	Exports of Canned Fish, January 1-September 28, 1963
69 ..	Fisheries Trends, January-September 1963	78 ..	Proposed Refinancing of State-Controlled Fish-Processing Company
	Iceland:		Panama:
69 ..	Icelandic Fishery Landings by Principal Species, January-July 1963	78 ..	Spiny Lobster Exploratory Fishing Project Concluded
69 ..	Iceland's Utilization of Fishery Landings, January-July 1963		Peru:
69 ..	Exports of Fishery Products, January-September 1963	79 ..	Fishing Industry Long-Range Forecast
	Ireland:	79 ..	Estimated Exports of Fish Meal and Fish Oil, 1963
70 ..	New Fishing Company Aided by Japanese and French Interests	80 ..	Fish Meal Export Agreement Extended
	Italy:		Poland:
71 ..	1963 Quota for Fresh and Frozen Tuna Imports Increased	80 ..	Landings of Marine Products and Size of Fishing Fleet, 1962-63
	Japan:		Portugal:
71 ..	Value of Frozen and Canned Tuna Exports, January-September 1963	80 ..	Canned Fish Exports, January-September 1963
71 ..	Canned Tuna Sale to the United States	81 ..	Canned Fish Pack, January-September 1963
71 ..	New Type Canned Tuna Product Developed		South-West Africa:
71 ..	Frozen Tuna Export Market in Early December 1963	81 ..	Quotas for 1963 and 1964 Pilchard Fishery Increased
72 ..	Albacore Tuna Ex-Vessel Price Trends, November-December 1963		Sweden:
72 ..	Frozen Tuna Export Market Trends, Mid-December 1963	81 ..	Fishing Industry Trends, 1962, and Estimate for 1963
72 ..	New Frozen Tuna Export Regulations Planned		Taiwan:
72 ..	Denmark Contracts to Import Frozen Tuna	84 ..	Shrimp Exports Increased in 1963
73 ..	Tuna Fishing Trends in Equatorial Pacific, November 1963		U. S. S. R.:
73 ..	Tuna Transshipment Operations at Durban, South Africa	84 ..	Fisheries Catch Goal Increased for 1964
73 ..	New Long-Line Gear Tested off West African Coast	84 ..	Marine Fishery Production Goals for 1963 Exceeded
73 ..	Fishing Vessel Construction Permits, Late 1963	84 ..	Specifications of Fish Factoryships Built by West German Shipyard
73 ..	Fishing Vessel Construction Permits, November 1963		United Kingdom:
73 ..	Government Stops Applications for Permits to Construct Small Tuna Vessels	85 ..	Canned Fish Marketing Trends
74 ..	Licenses Approved for Distant-Water Trawlers	85 ..	Stern Trawling Reviewed at Conference
74 ..	Atlantic Trawl Fishery Trends, November-December 1963		Venezuela:
75 ..	Saury Fishery Production and Export Trends, Late November 1963	87 ..	New Shrimp-Processing Plant
75 ..	Plans Call for Doubling Salmon Hatchery Facilities		FEDERAL ACTIONS:
75 ..	Unmanned Oceanographic Stations to be Set Up off Coast		Department of Commerce:
	Malaysia:		Area Redevelopment Administration:
75 ..	Market Trends for Imported Canned Sardines	88 ..	Willapa Bay, Washington, Oyster Industry Study Approved
76 ..	Fisheries Trends, Third Quarter 1963		Department of Health, Education, and Welfare:
	Morocco:		Food and Drug Administration:
76 ..	Canned Fish Exports, June-September 1962-63	88 ..	Public Hearing on Standards of Identity for Frozen Raw Breaded Shrimp
	Netherlands:		U. S. Tariff Commission and U. S. Trade Information Committee:
76 ..	Views on Northeast Atlantic and European Fishery Policies	89 ..	Hearings Held on Some Fishery Products Preliminary to 1964 GATT Negotiations
77 ..	Oyster Industry Declines		U. S. Tariff Commission:
		91 ..	Hearings on Exclusion of Groundfish and Ocean Perch Fillets from Tariff Modification
			Department of the Treasury:
		91 ..	Halibut Steaks from Japan Not Being Sold at Less Than Fair Value
		91 ..	Public Hearing Held on Antidumping Regulations
		91 ..	Eighty-Eighth Congress (First and Second Sessions)
			RECENT FISHERY PUBLICATIONS:
		94 ..	Fish and Wildlife Service Publications
		96 ..	Miscellaneous Publications



For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.
Price 60 cents (single copy). Subscription Price: \$5.50 a year; \$2 additional for foreign mailing.

COMMERCIAL FISHERIES REVIEW

February 1964

Washington, D. C.

Vol. 26, No. 2

UTILIZATION OF U. S. OTTER-TRAWL SHRIMP VESSELS IN THE GULF OF MEXICO, 1959-1961

By Roy L. Lassiter, Jr.*

SUMMARY AND CONCLUSIONS

The study is based on an analysis of the operations of a sample of 1,000 United States otter-trawl shrimp vessels over 15 gross tons in size for each of the years 1959, 1960, and 1961.

There was substantial variation in average landings between and within vessel size classes over the time period studied. Average landings and fishing effort increased with vessel size through the 60- to 69-gross ton class, and the relative variation in productivity and fishing effort among vessels decreased through this same class. However, even within the more productive vessel size classes, such factors as weather, skill and luck of the captain and crew, and the availability of shrimp caused substantial variation in productivity and fishing effort among vessels.

The relatively high correlations between landings and days fished indicate that the "days fished" concept is an adequate measure of fishing effort. Additional fishing days on the average contributed substantially to increased landings. However, again there was considerable variation in results among vessels.

There was substantial seasonal variation in the extent to which shrimp vessels are utilized. Furthermore, this variation was inversely related to vessel size. Typically, a high proportion of the large vessels were active in shrimp fishing throughout the year which in part explains the higher annual average landings by those vessels. A substantial part of the shrimp fleet is underutilized, in the sense that it is inactive during the winter and early months of the year. If suitable alternative vessel uses could be found during those periods of low shrimp availability, the over-all economic productivity of those vessels would be increased. On the other hand, it is apparent that a substantial portion of the fleet is fully utilized in shrimp fishing when time allowance is made for vessel maintenance, running time, crew vacations, and adverse weather conditions. Many of the long-range vessels that fish over wide areas of the Gulf appear to be employed about as fully as could be expected.

BACKGROUND

This paper has as its purpose the presentation of the over-all purpose, procedures, and some of the findings of an extensive statistical analysis and study of shrimp vessels operating in the Gulf of Mexico. Those aspects of the findings of the study dealing with over-all vessel productivity, fishing effort, and seasonality of vessel operations are presented.

*Associate Professor of Economics, University of Florida, Gainesville, Fla.

Note: This study was conducted for the U. S. Bureau of Commercial Fisheries under Contract No. 14-17-0007-46 with the Bureau of Economic and Business Research, University of Florida. This paper reports on important aspects of the over-all study. The complete report was published by the Bureau of Economic and Business Research, University of Florida, in the fall of 1963.

U. S. DEPARTMENT OF THE INTERIOR
Fish and Wildlife Service
Sep. No. 700

OVER-ALL PURPOSE AND PROCEDURES

The basic study attempts to define the extent to which United States shrimp vessels were utilized in the Gulf of Mexico area in 1959, 1960, and 1961. Vessel utilization was measured primarily in terms of pounds of shrimp landed and "days fished," and was examined on an annual and seasonal basis as related to vessel size, controlling port, and area fished. A "day fished" is defined as 24 hours spent in some phase of the actual fishing operation. Vessel size was measured in gross tons. The controlling port is the port with which the vessel is identified for purpose of statistical compilation. The fishing areas are those used by the U. S. Bureau of Commercial Fisheries for statistical and biological research purposes.

The basic data for the study were obtained from a random sample of 1,000 vessels selected from the U. S. Bureau of Commercial Fisheries listing on Machine Run No. 8 for each of the years 1959, 1960, and 1961. This sample size represents about one-third of the total shrimp vessels operating in the Gulf of Mexico in those years. The vessels selected were of 15 gross tons and over in size, and additional data on controlling port was obtained from the "Vessel Code Book" of the U. S. Bureau of Commercial Fisheries. The data from Machine Run No. 8 and that from the "Vessel Code Book" were punched on machine cards and extensive computations were made regarding landings, days fished, area fished, etc., as consistent with the purposes of the study. The findings were supported and validated by an informal field investigation throughout the Gulf area.



A typical Louisiana offshore trawler of about 60 ft. over-all length and 16 net tons.

PRODUCTIVITY AND FISHING EFFORT OF SAMPLE VESSELS, 1959-1961

The landings of the 1,000 sample vessels amounted to 33.4 million pounds in 1959, 39.1 million pounds in 1960, and 27.2 million pounds in 1961 (table 1). In both 1959 and 1960 median^{1/} landings per vessel were greater than the mean^{2/} vessel landings. However, in 1961 this was reversed indicating that more than one-half of the vessels caught less than the arithmetic mean landings. There was considerable variability in landings among the vessels in all three years, with the greatest relative variation occurring in 1961.

The mean and median number of days fished for the 1,000 sample vessels amounted to approximately 45 to 52 days per year over the period. On a relative basis the variation among the sample vessels in terms of days fished, although considerable, was less than that on the basis of landings. The distributions of vessels in terms of days fished were more symmetrical than those when vessels were distributed on the basis of landings.

Landings and fishing effort also varied with vessel size. When the 1,000 vessels were sorted by vessel size, it was evident that average landings and days fished increased with vessel size. ^{1/}The median means that there are just as many vessels landing more than the median vessel as there are vessels landing less than the median vessel.

^{2/}The arithmetic mean is synonymous with "average," which is obtained by dividing the sum of the landings by the number of vessels.

sel size, at least through the 60- to 69-ton class (table 2). The vessels in the 60- to 69-gross-ton category recorded the highest average landings in 2 out of the 3 years and the highest average days fished in all 3 years. Furthermore, the relative variation in both landings and days fished decreased with vessel size through the 60- to 69-gross-ton category.

The relationship between productivity (as measured by landings) and fishing effort (as measured by days fished) was investigated further by simple linear regression and correlation techniques.^{3/} This analysis revealed a high positive relationship between landings and days fished in each of the three years (table 3). The correlation coefficients and the amount of the variation "explained" by the regression of landings on days fished were somewhat lower for the medium to large vessels than for the very small and very large vessels. While this may seem contradictory to the analysis of mean landings, it primarily is explained in terms of the seasonal patterns of fishing activity by vessel size which is to be discussed in the following section.

The average addition to landings associated with an additional day fished (as measured by the regression coefficients) amounted to 733 pounds in 1959, 766 pounds in 1960, and 617 pounds in 1961. The standard error of the estimate for all size classes and for each year indicated substantial variability in results from additional fishing effort among the vessels.

SEASONALITY OF VESSEL UTILIZATION OF ALL SAMPLE VESSELS

Investigation of the activity of the 1,000 sample vessels on a monthly basis revealed substantial variation in landings and effort throughout each of the years 1959, 1960, and 1961 (table 4). The seasonal patterns were essentially the same in each year except that landings in June, July, August, and September of 1961 did not rise to normal levels because of the failure of brown shrimp to appear in usual quantities in the central and western Gulf. The seasonal low of vessel activity occurs in the months of February, March, and April when approximately only 50 to 60 percent of the vessels are active. Vessel activity increases from the low months to a peak in July and August and then gradually declines throughout the remainder of the year. Mean landings and days fished tend to follow the same pattern. The pattern of mean days fished per trip is inverse to that just described in that the lowest

^{3/}Regression techniques show the functional relationship between two variables. In the case of this study it gives an expected change in productivity for a given change in fishing effort. Correlation techniques measure the proportion of the variations in the dependent variable (productivity) accounted for by variations in the independent variable (effort).

Table 1 - Number of Sample United States Otter-Trawl Shrimp Vessels Fishing the Gulf of Mexico Area Classified by Landings and Days Fished, 1959-1961

	1961	1960	1959
Landings	.. (Number of Vessels Reporting) ..		
1,000 Lbs.			
10.9 and under . . .	191	119	154
11.0 to 20.9	226	122	125
21.0 to 30.9	196	133	173
31.0 to 40.9	148	159	189
41.0 to 50.9	142	165	183
51.0 to 60.9	68	135	107
61.0 to 70.9	23	101	51
71.0 to 80.9	2	47	17
81.0 to 90.9	2	9	3
91.0 and over	2	13	2
Total vessels	1,000	1,003	1,004
Total landings	27,218.4	39,053.9	33,388.6
Mean:	(1,000 Lbs.)		
Landings per vessel	27.2	38.9	33.3
Median:			
Landings per vessel	25.2	39.0	33.6
Standard deviation of:			
Landings	17.0	21.5	18.6
Coefficient of variation of:	(Percent)		
Landings	62.4	55.3	56.1
Days Fished	.. (Number of Vessels Reporting) ..		
1,000 Lbs.			
10.9 and under . . .	67	88	95
11.0 to 20.9	91	55	78
21.0 to 30.9	103	100	106
31.0 to 40.9	128	123	156
41.0 to 50.9	119	118	153
51.0 to 60.9	125	151	133
61.0 to 70.9	144	122	110
71.0 to 80.9	97	98	99
81.0 to 90.9	77	78	53
91.0 and over	49	70	21
Total vessels	1,000	1,003	1,004
Total days fished . .	49,595.4	51,238.7	45,984.5
Mean:	(Number)		
Days fished per vessel	49.6	51.1	45.8
Median:			
Days fished per vessel	50.9	52.2	45.4
Standard deviation of:			
Days fished	25.1	25.8	23.7
Coefficient of variation of:	(Percent)		
Days fished	50.6	50.5	51.7

Note: Source--Data in tables 1-4 were compiled from U. S. Bureau of Commercial Fisheries Machine Run No. 8. Landings in thousands of pounds and days fished in number of days. Four additional vessels in 1959 and three additional vessels in 1960 were inadvertently included in the tabulations. These were left in because of the difficulty of extricating the landings and effort of these vessels and further because with such a large sample size they will have little impact on the results.

Table 2 - Means, Medians, Standard Deviations, and Coefficients of Variation of Landings and Days Fished of Sample Vessels in the Gulf of Mexico Area, Classified by Vessel Size, 1959-1961

Vessel Size in Gross Tons	Mean Landings and Days Fished			Median Landings and Days Fished			Standard Deviation of Landings and Days Fished			Coefficient of Variation of Landings and Days Fished			
	1961	1960	1959	1961	1960	1959	1961	1960	1959	1961	1960	1959	
15 to 29: Landings (1,000 lbs.) Days fished (no.) . .	12.3 28.3	21.9 30.4	20.5 28.9	11.2 26.6	21.2 30.7	20.3 29.5	8.7 17.5	12.6 17.7	13.4 17.2	Percent Days	70.9 61.8	57.6 58.2	65.4 59.5
30 to 39: Landings (1,000 lbs.) Days fished (no.) . .	20.8 40.6	33.6 44.8	26.5 37.4	18.9 39.3	32.4 45.2	26.9 38.1	13.3 20.9	17.8 20.7	15.4 19.4	Percent Days	63.8 51.5	52.9 46.2	58.0 51.9
40 to 49: Landings (1,000 lbs.) Days fished (no.) . .	26.0 48.3	39.9 50.4	32.8 45.6	24.1 49.8	39.0 52.8	33.5 45.4	14.5 22.4	21.0 23.4	16.6 21.0	Percent Days	55.9 46.4	52.7 46.4	50.5 46.1
50 to 59: Landings (1,000 lbs.) Days fished (no.) . .	31.0 56.7	45.2 59.2	38.3 52.5	30.3 58.4	47.2 62.1	38.9 55.3	13.9 22.6	19.3 22.5	16.5 20.6	Percent Days	44.9 39.9	42.7 38.0	43.1 39.2
60 to 69: Landings (1,000 lbs.) Days fished (no.) . .	41.4 69.2	53.3 70.1	47.7 65.8	42.2 71.4	54.8 74.0	48.1 68.6	14.4 18.1	19.0 23.0	14.8 20.2	Percent Days	34.9 26.2	35.8 32.8	31.0 30.7
70 to 79: Landings (1,000 lbs.) Days fished (no.) . .	42.8 69.0	49.8 62.9	47.1 59.7	43.7 71.0	52.7 67.5	48.4 65.3	14.6 18.8	19.3 23.5	19.7 20.5	Percent Days	34.0 27.2	38.8 37.4	41.7 34.3
80 and over: Landings (1,000 lbs.) Days fished (no.) . .	33.3 58.0	42.0 52.8	40.4 51.1	33.0 63.5	43.0 55.0	41.0 48.5	16.5 24.9	26.9 31.7	23.8 26.0	Percent Days	49.6 42.9	64.0 60.0	59.0 50.9

Note: See table 1 for explanation of source data.

Note: See table 1 for explanation of source data.

average days fished per trip occur in the months of peak landings and fishing activity. This is the result of large quantities of shrimp being available close to the mainland in the central and western Gulf areas. In the early months of the year a substantial portion of the shrimp fishing activity is located off the Mexican coast and the average days fished per trip is higher.

SEASONALITY OF VESSEL UTILIZATION BY VESSEL SIZE

It would be suspected that weather conditions and the location of shrimp in the winter months would affect the seasonality of vessel use in the various size categories, as was the case. Typically the proportion of smaller vessels active in the early months of the year was small while a higher proportion of the medium to large vessels remained active throughout the year. Only 25 to 30 percent of the vessels in the 15- to 29-gross-ton class were active during February and March as contrasted to over 55 percent active vessels in the 60- to 69-

Table 3 - Correlation Coefficients, Coefficients of Determination, Y Intercept Values, Regression Coefficients, and Standard Error of Estimates of Correlations Between Landings and Days Fished for Sample Otter Trawl Shrimp Vessels in the Gulf of Mexico Area, Classified by Vessel Size, 1959-1961

Vessel Size in Gross Tons	Correlation Coefficient			Coefficient of Determination			Y Intercept Values		
	1961	1960	1959	1961	1960	1959	1961	1960	1959
15 to 29	0.90	0.91	0.93	0.81	0.83	0.86	- 805.13	- 56.18	- 241.94
30 to 39	0.88	0.90	0.93	0.77	0.81	0.86	-1,958.79	-2,024.30	-1,793.99
40 to 49	0.87	0.89	0.92	0.76	0.79	0.85	- 491.39	- 46.12	- 994.20
50 to 59	0.87	0.89	0.90	0.76	0.79	0.81	603.18	962.15	40.76
60 to 69	0.85	0.89	0.81	0.72	0.79	0.66	-3,557.59	2,304.06	9,128.68
70 to 79	0.90	0.81	0.92	0.81	0.66	0.85	-3,543.26	7,908.36	-4,511.17
80 and over	0.93	0.97	0.92	0.86	0.94	0.85	-3,204.43	-1,609.76	-3,816.50
All sample vessels	0.92	0.92	0.93	0.85	0.86	0.92	-3,398.12	- 203.91	- 327.72

Vessel Size in Gross Tons	Regression Coefficients			Standard Error of Estimates		
	1961	1960	1959	1961	1960	1959
15 to 29	463.64	722.86	718.07	3,889.22	5,738.25	4,986.61
30 to 39	560.14	794.22	756.06	6,235.22	8,126.44	5,951.77
40 to 49	548.88	792.26	741.56	7,265.86	9,892.74	6,684.49
50 to 59	535.50	747.56	727.49	6,875.45	9,306.06	7,201.02
60 to 69	649.22	726.59	586.80	7,502.83	8,670.31	8,442.36
70 to 79	671.65	665.84	864.72	6,164.24	11,623.21	7,799.04
80 and over	628.81	826.98	864.47	5,876.87	6,287.73	9,764.36
All sample vessels	617.33	766.19	733.24	6,808.47	8,603.53	7,084.56

Note: See table 1 for explanation of source data.

Note: See table 1 for explanation of source data.

gross-ton category. The highest proportion of vessels active for all vessel size classes was recorded in July through October.

The mean landings per active vessel by size class behaved in essentially the same manner as the proportion of vessels active. The mean landings per month of the vessels in the 60- to 69-gross-ton class were higher than those of the other size classes except in July and September when the vessels of 80 gross tons and over averaged higher landings. There were substantial differences in mean landings per active vessel between vessel size classes and substantial ranges in mean landings per active vessel within size classes over the year. Peak landings for all vessel size classes occurred in the months of June through October.

Table 4 - Number of All Sample Vessels in the Gulf of Mexico Area Reporting Activity and the Average Effort and Productivity by Month, 1959-1961

Month and Year	Vessels Reporting Activity	Mean Landings Per Vessel	Mean Days Fished Per Vessel	Mean Trips Per Vessel	Mean Landings Per Day Fished	Mean Landings Per Trip	Mean Days Fished Per Trip
	No.	Lbs.	No.	No.	Lbs.	Lbs.	No.
January:							
1961 . . .	604	3,076	5.0	2.3	617	1,353	2.2
1960 . . .	604	2,831	4.8	2.2	585	1,307	2.2
1959 . . .	640	1,997	4.3	2.2	462	891	1.9
February:							
1961 . . .	577	2,770	5.2	2.2	535	1,261	2.4
1960 . . .	578	2,424	4.5	2.0	540	1,202	2.2
1959 . . .	564	1,891	4.9	1.9	382	986	2.6
March:							
1961 . . .	576	3,107	6.1	2.7	511	1,169	2.3
1960 . . .	506	2,963	5.3	2.2	558	1,337	2.4
1959 . . .	537	1,815	5.5	2.5	332	730	2.2
April:							
1961 . . .	568	2,293	5.0	2.5	462	900	1.9
1960 . . .	617	3,004	5.4	2.4	553	1,271	2.3
1959 . . .	588	1,857	5.0	2.3	374	820	2.2
May:							
1961 . . .	651	2,236	5.5	2.6	404	860	2.1
1960 . . .	662	2,534	5.7	2.4	448	1,058	2.4
1959 . . .	684	2,084	5.5	2.4	380	870	2.3
June:							
1961 . . .	803	2,905	6.2	2.8	469	1,032	2.2
1960 . . .	766	3,490	6.3	2.7	555	1,293	2.3
1959 . . .	729	4,009	5.6	2.7	721	1,472	2.0
July:							
1961 . . .	864	3,808	6.9	3.3	550	1,156	2.1
1960 . . .	826	7,962	7.2	3.9	1,110	2,044	1.8
1959 . . .	764	6,477	6.3	3.3	1,026	1,991	1.9
August:							
1961 . . .	853	3,897	7.3	3.1	532	1,274	2.4
1960 . . .	838	6,735	6.9	3.6	982	1,881	1.9
1959 . . .	795	6,066	6.1	3.3	992	1,857	1.9
September:							
1961 . . .	770	3,162	4.6	2.5	681	1,284	1.9
1960 . . .	809	5,876	6.7	3.4	868	1,745	2.0
1959 . . .	785	5,992	6.3	3.2	951	1,867	2.0
October:							
1961 . . .	743	4,127	6.6	3.2	623	1,276	2.0
1960 . . .	826	6,501	7.0	3.4	935	1,912	2.0
1959 . . .	782	5,761	6.2	3.1	932	1,850	2.0
November:							
1961 . . .	677	3,333	5.3	2.7	626	1,248	2.0
1960 . . .	817	4,511	6.1	2.8	740	1,639	2.2
1959 . . .	735	3,671	4.6	2.6	796	1,437	1.8
December:							
1961 . . .	676	3,381	5.8	2.1	578	1,585	2.7
1960 . . .	679	2,981	4.7	2.1	641	1,431	2.2
1959 . . .	690	3,650	4.9	2.5	742	1,469	2.0

Note: See table 1 for explanation of source data.

In terms of mean days fished by active vessels, the vessels in the 60- to 69-gross-ton class were consistently higher than the vessels in the other size classes. The seasonal pattern was less well defined by this measure of vessel utilization, although for the smaller vessel size classes it was still well defined. Seasonality was well pronounced in terms of mean

landings per day fished for all vessel size categories, but the advantage of vessel size was less apparent.

Mean landings per fishing trip and mean days fished per trip by vessel size class clearly indicated differences associated with vessel size. The fishing trips of the larger vessels were longer and landings were greater. The vessels in the 60- to 69-gross ton class caught more shrimp per trip and made longer trips than the vessels in the other size classes. Further investigation revealed that the vessels in this size class were those which ranged the greatest distance over the Gulf of Mexico fishing the Campeche-Obregon area in the winter and spring, moving off the Texas coast in the summer and early fall, and then returning to Campeche.



SHRIMP RECIPES

SHRIMP DE JONGHE

- | | |
|--|---|
| 4 cans ($4\frac{1}{2}$ or 5 ounces each) shrimp | $\frac{1}{4}$ teaspoon crushed garlic |
| $\frac{3}{4}$ cup toasted dry bread crumbs | $\frac{1}{4}$ teaspoon nutmeg |
| $\frac{1}{4}$ cup chopped green onions | $\frac{1}{4}$ teaspoon salt |
| and tops | Dash pepper |
| $\frac{1}{4}$ cup chopped parsley | $\frac{1}{2}$ cup butter or margarine, melted |
| $\frac{3}{4}$ teaspoon crushed tarragon | $\frac{1}{4}$ cup sherry |

Drain shrimp. Cover shrimp with ice water and let stand for 5 minutes; drain. Combine crumbs, onion, parsley, and seasonings. Add butter and sherry; mix thoroughly. Combine crumb mixture and shrimp; toss lightly. Place in a well-greased, shallow 1-quart casserole. Bake in a hot oven, 400° F., for 15 to 20 minutes or until lightly browned. Serves 6.

SHRIMP MACARONI SALAD

- | | |
|---|--------------------------------------|
| 3 cans ($4\frac{1}{2}$ or 5 ounces each) shrimp | 3 tablespoons garlic French dressing |
| 2 cups cooked shell macaroni | 1 tablespoon lemon juice |
| 1 cup chopped raw cauliflower | 1 teaspoon grated onion |
| 1 cup sliced celery | 1 teaspoon celery seed |
| $\frac{1}{4}$ cup chopped parsley | 1 teaspoon salt |
| $\frac{1}{4}$ cup chopped sweet pickle or drained pickle relish | $\frac{1}{4}$ teaspoon pepper |
| $\frac{1}{2}$ cup mayonnaise or salad dressing | Salad greens |
| | 1 hard-cooked egg, sliced |

Drain shrimp. Cover shrimp with ice water and let stand for 5 minutes; drain. Cut large shrimp in half. Combine macaroni, cauliflower, celery, parsley, pickle, and shrimp. Combine mayonnaise, French dressing, lemon juice, onion, and seasonings; mix thoroughly. Add mayonnaise mixture to shrimp mixture and toss lightly; chill. Serve on salad greens. Garnish with egg slices. Serves 6.

SHRIMP CHOWDER

- | | |
|--|-----------------------------|
| 3 cans ($4\frac{1}{2}$ or 5 ounces each) shrimp | 1 cup diced potatoes |
| $\frac{1}{4}$ cup chopped onion | $\frac{1}{2}$ teaspoon salt |
| 2 tablespoons melted fat or oil | Dash pepper |
| 1 cup boiling water | 2 cups milk |
| | Chopped parsley |

Drain shrimp and rinse with cold water. Cut large shrimp in half. Cook onion in fat until tender. Add boiling water, potatoes, and seasonings. Cover and cook for 15 minutes or until potatoes are tender. Add milk and shrimp; heat. Garnish with parsley. Serves 6.

PATIO SHRIMP PLATE

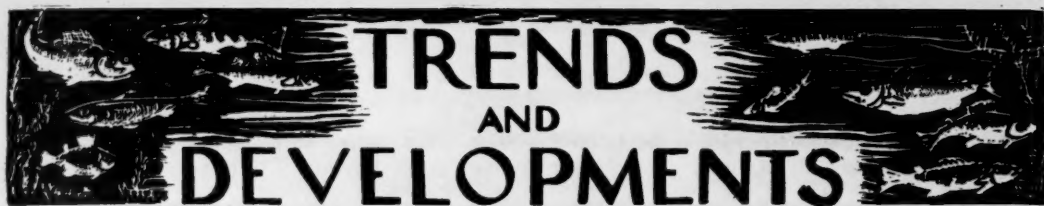
- | | |
|--|--------------------|
| 3 cans ($4\frac{1}{2}$ or 5 ounces each) shrimp | Lettuce |
| 1 large cucumber, sliced | Patio Shrimp Sauce |

Drain shrimp. Cover shrimp with ice water and let stand for 5 minutes; drain. Arrange shrimp and cucumber slices on lettuce. Serve with Patio Shrimp Sauce. Serves 6.

PATIO SHRIMP SAUCE

- | | |
|---------------------------|--------------------------------|
| 1 cup sour cream | $\frac{1}{2}$ teaspoon paprika |
| 1 tablespoon horseradish | $\frac{1}{2}$ teaspoon salt |
| 1 tablespoon grated onion | |

Combine all ingredients and blend well.



TRENDS AND DEVELOPMENTS

Alaska

MAJOR CHANGES IN COMMERCIAL FISHING REGULATIONS FOR 1964:

Major changes in Alaska's commercial fisheries regulations for 1964, which were adopted by the Board of Fish and Game at Ketchikan in December 1963, were as follows:

The definition of long-line gear was amended to include the type which can be used for fishing salmon. This change coupled with an amendment to the International Water Area section prohibits United States nationals taking salmon by both net or long-line gear in International Waters. This action is being taken by all Pacific Coast States as well as Canada to prevent the possibility of such a high-seas fishery becoming established.

Under the General Provisions section, applicable to all Alaska waters or designated areas, the use of mechanical clam diggers is permitted in the Kodiak, Chignik, Alaska Peninsula, and Aleutian Islands areas.

A further amendment to this section prohibits aliens not lawfully admitted to the United States from engaging in fishing activities in waters of the State of Alaska.

Under the International Waters section, the species and covered waters was broadened to include tanner and dungeness crab besides king crab, and the area was increased to include any waters seaward of that officially designated as the territorial waters of Alaska to a depth of 200 meters, or beyond that limit, to where the depth of the superjacent waters admits of the exploitation of these crabs. This action, expanding the covered International Waters from only those seaward of Cook Inlet and Kodiak, was taken by the Board to assert and demonstrate Alaska's interest in the conservation of the resources of the continental shelf as outlined in the 1958 Geneva Conference on the Law of the Sea. Regulations promulgated by the Board for these species in Cook Inlet and Kodiak will apply in the Inter-

national Waters previously described in the regulations for these areas.

Arctic-Yukon-Kuskokwim Area: Subdistrict No. 3 of the Yukon River, which is located from Owl Slough near Marshall upstream to the mouth of the Koyukuk River, will be open to commercial fishing 6:00 p.m. Monday to 6:00 p.m. Friday, four days a week, until the quota of 3,000 king salmon is taken. Commercial fishermen fishing this subdistrict cannot transfer and fish in subdistricts No. 1 and No. 2 at a later date.

Commercial fishing for king salmon in subdistrict No. 1 of the Kuskokwim River is open two days a week, 6:00 p.m. Monday to 6:00 p.m. Tuesday and from 6:00 p.m. Friday to 6:00 p.m. Saturday. It was the Board's decision that the king salmon run in this subdistrict should be managed by a weekly fishing period which can be adjusted according to the abundance of fish, rather than on a quota basis. Also, commercial fishing in subdistrict No. 1 of the Kuskokwim River will be allowed four days a week after August 1.

Those persons licensed to fish commercially in Norton Sound, with the exception of subdistrict No. 1, and the Kotzebue district, shall not be allowed to subsistence fish for six hours before each commercial fishing period. The intent of this regulation is to limit the illegal selling of fish, reduce fish wastage, and still allow commercial fishermen to take sufficient quantities of salmon for subsistence.

A permit will be required for all subsistence fishermen fishing in the Tanana drainage above the mouth of the Wood River and in the Pilgrim River drainage near Nome on the Seward Peninsula. Permits are free and may be obtained from the local Department of Fish and Game office prior to fishing.

Bristol Bay Area: The outer Naknek-Kvichak boundary was extended approximately five miles at the west end to Tank Creek.

The Egegik outer boundary was enlarged to a rectangular area projecting three miles offshore from Big Creek, due south approximately eight and one-half miles, and then due east three miles to a shore marker at Abalama Creek.

The Egegik inner boundary was enlarged slightly to just below Egg Island.

The inner boundary line of the Ugashik district was adjusted slightly to a straight line across the Ugashik River 500 yards below the terminus of King Salmon River.

A new regulation was adopted which requires each fisherman to indicate at the time of initial registration whether he is operating as an independent or a company.

Other slight changes were made in the dates to allow for calendar changes in 1964.

Alaska Peninsula Area: The Herendeen-Moller Bay section will open to fishing with set nets, drift nets, hand purse seines, and purse seines from May 4 through July 17. Closures were placed on the heads of the bays to give the milling areas protection.

All other changes concerned closed areas. Sandy and Bear Rivers will be closed 2,000 yards off the mouths during the peak of the runs, after which they will be reduced to 500 yards.

Warm Springs Bay will be closed 1 mile from the mouth of the main stream.

The closure at Thin Point Cove and Lagoon was extended to encompass the entire cove. The closure at the head of Cold Bay was enlarged.

Also adopted was an extension of the closure at San Diego Bay to 1 mile after July 18, and the upper end of Stepovak Bay, from Dent Point to Kupreanof Point, will close after July 15.

A razor clam season was opened with hydraulic dredges, forks, and shovels as legal gear.

No changes were made in the Aleutian Islands Area.

Chignik Area: Opening and closing dates for the Eastern district were adopted for taking salmon as follows: June 8 through Au-

gust 14 and from August 31 through September 25. This district formerly was opened and closed by field announcement.

Use of a hydraulic clam digger is now legal and a season for razor clams was established, January 1 to July 15 and September 15 to December 31. Hardshell clams may be taken from January 1 to December 31.

Kodiak Area: The Moser-Olga Bay and Alitak Bay sections of the Alitak district will open on July 13 and close on August 14. The weekly fishing period during this time will be seven days.

The Inner Karluk and Uyak sections of the Karluk district will have a mid-season closure from July 3 to July 13. The weekly fishing periods will be seven days to July 3, five days from July 13 to August 7, three days from August 10 to August 21, and seven days from August 24 to September 25.

The Uganik and Afognak sections of the Karluk district will be closed from July 3 to July 13 with a seven day weekly fishing period.

The Red River, Sturgeon River, Uyak Bay, Uganik, Afognak, General and Mainland districts will have a five day weekly fishing period from June 1 to July 17, and a seven day weekly fishing period from July 20 to September 25.

The inshore end of all set nets must be attached to the shore above mean low water in 1964.

The Deadman Bay, East Arm (Mush Bay), Sharatin Bay, and Seal Bay closures were enlarged.

Legal gear for taking razor clams will include hydraulic mechanical diggers.

Cook Inlet-Resurrection Bay Area: Regulatory changes enacted by the Board of Fish and Game for the Cook Inlet-Resurrection Bay Area for 1964 include closing the king salmon season to commercial fishing. Provision was made that king salmon caught accidentally while fishing for other species may be used for subsistence and welfare purposes only. Along with this major conservation move, the Board set June 25 as opening date for other species of salmon in the Northern, North Central, and South Central districts. Opening date for these districts last year was

June 6; most of the Inlet's king salmon catch in recent years has been taken prior to June 25. In another move aimed at helping to re-build depleted king salmon runs in the Inlet, the Board established a maximum mesh size of six inches for all gill nets in the Inlet.

Other action by the Board on Cook Inlet-Resurrection Bay regulations includes re-defining the Southern and Kamishak Bay districts to allow a larger area for unlimited pot fishing by king crab fishermen, and a southern boundary at the latitude of Cape Douglas was established for both the Outer and Eastern districts. June 8 was set as opening date for the Southern district, and all opening and closing times for salmon fishing were changed to 9:00 a.m. A seven day week fishing period was established for the Kamishak Bay district. Gill nets were made illegal in the eastern district, except for subsistence fishing, and all set nets are now to be restricted to 45 meshes in depth.

The east shore of Port Graham was closed to fishing by set nets, and three traditionally fished set net areas near Harriet Point were opened to set nets.

New subsistence fishing regulations include a mandatory permit for salmon and freshwater species (except that no trout, grayling, or char may be taken for subsistence in fresh water), and a report is required of all subsistence fish taken. A limit of 50 salmon was set for subsistence fishermen, and no subsistence fishing will be allowed in areas closed to commercial fishing for salmon except for the northwest shore of Knik Arm. Subsistence fishing will not be allowed north of Cottonwood Creek on Knik Arm.

Except for the opening dates, subsistence fishing in the Northern, North Central, South Central, and Southern districts will be in conformance with all commercial regulations, with identification of gear to consist of name and address of owner. August 20 has been set for opening dates for subsistence fishing in the North Central, South Central and Southern districts, with August 3 for the Northern district, except for that part of the district in the Moquawkie Indian Reservation, which opens June 25 for subsistence fishing.

Subsistence fishing in the Eastern and Outer districts will be in conformance with commercial regulations, and identification of fishing gear shall consist of name and address of

owner. Subsistence set nets will be allowed in the Eastern and Southern districts in all areas of these districts open to commercial fishing for salmon.

Prince William Sound Area: The Prince William Sound purse seine season will open July 13 with a weekly fishing period from 6:00 a.m. Monday to 6:00 a.m. Saturday. Also in 1964, purse seines will be allowed to fish with drift gill nets in the early Coghill district fishery. Eshamy district will be closed again in 1964.

Changes in the crab fishery included a color-marking system for crab-pot buoys instead of the present numbering system. To allow additional crab fishing area, open throughout the year, the "Inside" area north boundary was changed to run from Johnstone Point to Sheep Point.

Copper and Bering River drift gill-net districts will open May 14. Changes in the subsistence fishery were made to restrict the up-river fishing to the main Copper River. In addition, the lower Copper River subsistence limit was reduced, allowing a catch of five kings, ten reds, and ten silvers.

Yakutat Area: No changes were made in the Yakutat regulations from those in effect during 1963.

Southeastern Alaska Area: Several of the fishing districts had minor changes in that some sections were renumbered and one district, number 9 in Southern Chatham Strait, was divided into two sections: 9-A on the west side and 9-B on the east.

District 1 in the Ketchikan area was re-divided into six sections.

Seymour Canal in District 11 was designated as Section 11-D.

The section changes are to simplify emergency regulations and will be incorporated into the new Southeastern maps that accompany the printed regulations.

Trolling 7 days per week in District 8 was extended to include the whole district instead of the old "extended area;" this to be effective except during the gill net season, when both types of gear will fish three days per week.

Troll restrictions were relaxed in Kootznahoo Inlet, Idaho Inlet, Tenakee Inlet, Port

Althorp and off the Salmon River in Icy Passage.

Commercial dungeness crab fishing was prohibited in several bays near Ketchikan: Carroll Inlet, George Inlet, Bostwick Inlet, Traitors Cove, Smugglers Cove, Spacious Bay, Moser Bay, Helm Bay, Yes Bay, and Port Stewart.

Minimum mesh sizes for shrimp trawls were prescribed for cotton and synthetic mesh in Districts 6, 8, and 10.

The purse seine regulations had one minor change adopted requiring the marking on the cork line of all purse seines, every ten fathoms of length by double corks, that must be of a color that is in contrast with the color of the corks in the cork line.

All purse seine openings are to be by field announcement.

Amendments to the gill net section of the regulations provide for opening dates in sections 1-A and 1-B (formerly 1-B and 1-C), on June 14, sections 6-A and 6-B open on June 15.

Additional areas were added to the list of closed waters in 115.21. Among them were Edwards Passage, Nakat Bay, Nossuk Bay, Salt Lake Bay, Navy Creek, Canoe Pass, Menefee Inlet and Union Bay. The closure in Redfish Bay in District 13 was relaxed. (Alaska Department of Fish and Game, December 20, 1963.)

COOK INLET CLOSED TO KING SALMON FISHING IN 1964:

In December 1963, the Alaska Board of Fish and Game issued regulations closing Cook Inlet to all king salmon fishing (both sport and commercial) during 1964. It had become apparent that this once important run of fish was declining in abundance. The most obvious cause was overfishing.

During the late 1930's and the 1940's the annual commercial catch of king salmon in the Cook Inlet area was steady at around 77,000 fish and in 1951 it increased to a high of 187,000. But the largest catch since 1958 was only 28,000 fish with a low of 17,600 in 1963. The sport fishery has brought increasing pressure on the resource as the number

of people in the Anchorage and Kenai areas has grown.

Since 1959, sport and commercial fishing for Cook Inlet king salmon has been increasingly restricted, but king salmon escapement has not improved. It was felt, therefore, that drastic action was needed to rebuild the run before it declined to a point where extensive and expensive artificial aids would be needed for recovery. The Alaska Commissioner of Fish and Game pointed out that many miles of spawning streams used by Cook Inlet king salmon remain intact and have the fish-producing potential of the 1940's. What is required is a greater number of fish on the rearing grounds. This should be provided by the action taken by the Alaska Board of Fish and Game. (Alaska Department of Fish and Game, December 14, 1963.)

FOREIGN FISHING EFFORTS REDUCED IN OCTOBER 1963:

With the onset of autumn storms in the Gulf of Alaska and Bering Sea, Soviet and Japanese fishing efforts continued to decline. By the end of October most vessels had departed the Gulf area. The Soviet fleet strength diminished to less than 20 vessels in waters off Alaska and Japanese fisheries comprised about 20 vessels in the eastern Bering Sea at the close of October 1963.

U.S.S.R.: The trawl fisheries off southwest Kodiak Island, which since early summer 1963 have received the major Soviet effort, were continually reduced throughout October and by the last week of that month had entirely withdrawn from the area. Soviet fisheries had then dwindled to relatively minor trawling efforts in the mid-Aleutian chain region and a whaling fleet operating far west in the Attu Island area.

Japan: Japanese fishing efforts during October were reduced to a shrimp fishery near the Pribilof Islands and two factory trawlers conducting "exploratory" fishing off southwest Kodiak. The Japanese "exploratory" efforts in the Gulf of Alaska were scheduled to terminate at the end of October 1963.

UNIVERSITY OF ALASKA APPOINTS FISHERY EXTENSION COURSE SPECIALIST TO FACULTY:

The University of Alaska has appointed John P. Doyle as a member of its faculty to

to conduct extension education courses for commercial fishermen patterned after the University's prospecting and mining extension courses. This development is a direct result of the enthusiastic acceptance of the Fisherman's Short Courses offered the past two years by the University of Alaska in cooperation with the Ketchikan Technological Laboratory.



Alaska Fishery Investigations

LARGE RED SALMON SPAWNING POPULATION DISCOVERED IN NAKNEK RIVER:

In early October 1963, while preparing the King Salmon station for the winter, several trips were made by U. S. Bureau of Commercial Fisheries biologists to the outlet of Naknek Lake to observe the progress of red salmon spawning. In the past it was known that reds spawned in the upper end of the Naknek River, but it was thought their numbers were insignificant in relation to those occupying the better known areas in the upper lakes of the system. Observations made in the fall of 1963 indicate that, at times, spawners utilizing that area represent a substantial segment of the Naknek run. That section may have escaped notice up to now because the spawners are difficult, if not impossible, to observe from the air because of water depth and coloration of the bottom.

Spawning took place over a distance of about three miles, from one-half mile below Gull Island to the head of the rapids. Spawning began in the first week in September and continued through the first week in October, occurring first in the area just above the rapids. By mid-October 1963 only a few spawners were left on the shallow shelf at the outlet.

KARLUK RIVER RED SALMON SPAWNING VERIFIED:

The upper Karluk River study was terminated on October 1, 1963, and Portage weir was removed. A mark and recapture technique was used to estimate the number of red salmon spawning in the upper Karluk River. Salmon were tagged at Karluk Portage, on the Karluk River seven miles downstream from the lake outlet, and tagged fish entering the lake were recorded as they passed through Karluk weir. An estimated 47,000 red salmon,

representing 10 percent of the total escapement, remained in the river to spawn. The fraction remaining in the river to spawn is in close agreement with past estimates based on aerial surveys. Adult escapement of red salmon to Karluk Lake numbered 404,543 by October 14.

HEAVY FISHING RATE SHOWN ON TAGGED KING CRABS:

About 20 percent of the tagged king crab released during August and September 1963, have been recaptured by fishermen on the Portlock and Albatross Banks north and east of Kodiak. It was expected that a further substantial percentage of the 1963 tags would be returned during the 1963/64 winter as the fishing effort intensifies in the offshore areas.

SHRIMP POTS IN VERTICAL STRING FISH BETTER WITH BLACK MESH:

After preliminary trials in August 1963, a vertical string of six shrimp pots was set again in Tutka Bay in 45 fathoms of depth. Since there was a question of avoidance by shrimp of the pots covered with white nylon mesh, the pots were fished in black mesh--white mesh pairs at each level.

The results of this preliminary experiment were interesting. Light catches of shrimp were taken at all levels and the black mesh-covered pots appeared to be more effective than the natural white nylon at all levels except the topmost. At the 1-fathom level mostly pink shrimp were taken, pinks and coonstripe were caught at the 10-fathom level, and mostly coonstripes were taken at from 10 to 45 fathoms.



California

FISHERMEN'S INCOME, 1962:

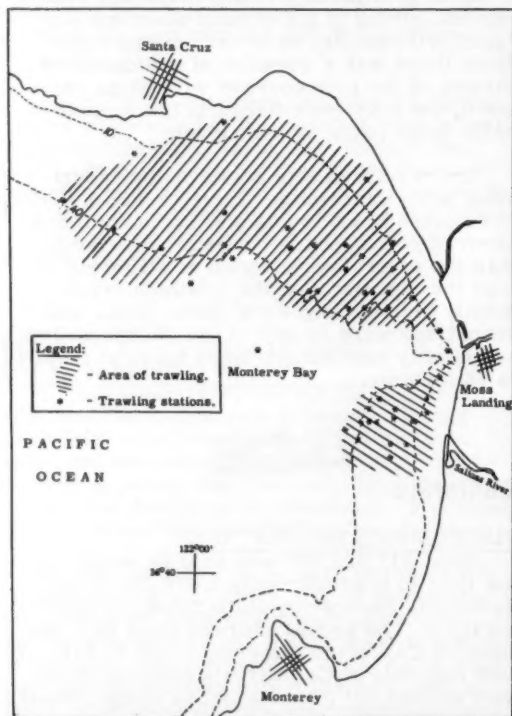
About \$17,596,000 was paid in wages during 1962 to approximately 2,076 California fishermen covered by State unemployment insurance. The annual average wage paid the covered California fishermen was \$8,476. About one-half of California's covered fishermen worked out of ports in San Diego County and a little over one-third of the fishermen were from Los Angeles and Orange Counties.

The average wage paid to fishermen in 1962 was \$10,427 in San Diego County and \$7,956 in Los Angeles and Orange Counties. The average wage paid covered California workers in "all industries" in 1962 was \$5,891. (State of California, Department of Employment.)

GROWTH STUDIES OF ENGLISH SOLE AND BOTTOMFISH IN MONTEREY BAY:

M/V "Nautilus" Cruise 63-N-5a-b-Bottomfish (October 8-12 and December 3-7, 1963): These two cruises to collect juvenile and adult English sole in Monterey Bay in the vicinity of Moss Landing were the first of a series by the California Department of Fish and Game research vessel *Nautilus*. The fish were measured, and interopercle bones were taken for age determinations to be used in growth analysis.

A modified $1\frac{1}{4}$ -inch mesh Gulf of Mexico shrimp trawl with a 1-inch cod end was used on these cruises. Trawling covered both sides



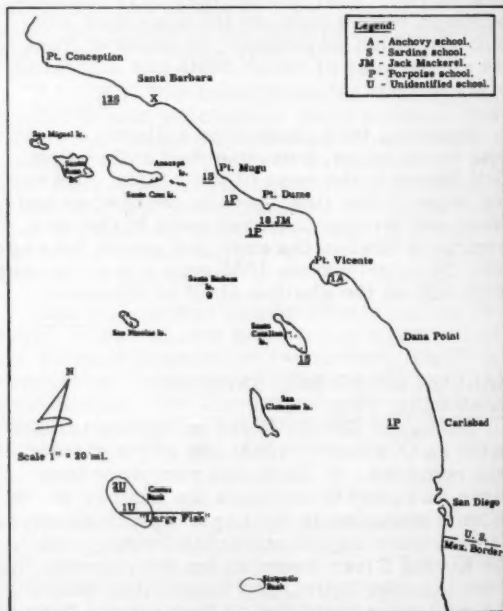
Cruises 63-N-5a and b (bottomfish) by research vessel *Nautilus*, showing trawling area and stations.

of Monterey Canyon in depths of 5 to 48 fathoms and the net was towed about 15 minutes at each station.

A total of 44 trawls was made during both cruises. From the stations worked, 1,372 juvenile and adult English sole were measured and their sex determined. The fish ranged from 86 to 380 millimeters (about 3.4 to 15 inches) long. Females were most abundant in the 200-250 millimeter (about 7.9 to 9.8 inches) size group. Two interopercle bones from each centimeter size group were selected for each sex. Samples of Dover sole (*Microstomus pacificus*) and petrale sole (*Eopsetta jordani*) were also measured and their sex determined. All cephalopods were preserved for study.

PELAGIC FISH POPULATION SURVEY CONTINUED:

Airplane Spotting Flight 63-10 (October 8-9, 1963): Surveys to determine the distribution and abundance of pelagic fish schools in the southern California area were continued by the California Department of Fish and Game *Twin Beechcraft N5614D* in the inshore area from Point Conception to San Diego and the



Pelagic fish survey flight 63-10.

offshore islands and banks off southern California and northern Baja California, Mexico.

General haze throughout the flight area (Pt. Vicente to San Diego, Sixtymile and Cortez Banks, and San Clemente and Santa Catalina Islands) on October 8, reduced aerial visibility to 15 miles. Water visibility was good although there was some surface glare.

At Cortez Bank, one school of large tuna-like fish was seen but not identified as to species. Two schools of smaller unidentified fish were also seen. Positive identification was not possible because those fish sounded whenever the plane passed overhead. One small school of Pacific sardines (*Sardinops caeruleus*) was seen off Church Rock at the south end of Santa Catalina Island.

On October 9, the inshore area between Pt. Vicente to Point Conception and the offshore area in the vicinity of San Miguel, Santa Cruz, and the Anacapa Islands were surveyed.

Air and water visibilities were fair. No fish schools were sighted around the islands. In northeast Santa Monica Bay, between Pt. Vicente and Pt. Dume, 18 jack mackerel (*Trachurus symmetricus*) and 2 unidentified porpoise schools were seen. Twelve schools of sardines were noted north of Santa Barbara and one off Pt. Mugu.

Note: See Commercial Fisheries Review, December 1963 p. 17, November 1963 p. 21, September 1963 p. 14.

Airplane Spotting Flight 63-11 (October 14-17, 1963): The survey to determine the inshore distribution and abundance of pelagic fish schools was continued by the California Department of Fish and Game Cessna "182" 9042T during flights over the inshore area from the United States-Mexican Border to Monterey, California.

The area from Point Vicente to Monterey was flown on October 14. Weather and visibility were poor south of Jalama Park (Point Arguello) but very good to the north. Water visibility followed the same pattern.

A large school group of northern anchovies (*Engraulis mordax*) was seen between Mussel Point and Piedras Blancas. This group, comprising 293 separate schools, was one of the largest observed from the air in several months. Many of the schools were being harassed by sea lions and porpoises from below and birds from above. Twenty-four anchovy

schools were counted in exceptionally clear water between Piedras Blancas and Point Sur where fish schools are seldom seen.

Coastal waters from the United States-Mexican Border to Point Vicente were scouted on October 15. Water visibility was poor. Air visibility was limited to 10 miles by haze and smoke. Thirty-two anchovy schools were sighted, all off the La Jolla-Torrey Pines area.

On October 16, the scheduled flight was cancelled by bad weather.

The inshore area from the United States-Mexican Border to Jalama Park was flown on October 17. Air and water visibility were only fair. Twenty-five schools of "pinhead" anchovies were seen off of the "barn," a sailor's landmark on Camp Pendleton. Eight killer whales (*Orcinus orca*) were seen 2 miles north and $\frac{1}{2}$ miles offshore from Point Dume; the 6 adults and 2 juveniles were slowly swimming south. This was only the second sighting of those mammals since the monthly flights were inaugurated in 1956.

Note: See Commercial Fisheries Review, Dec. 1963 p. 19.



Central Pacific Fisheries Investigations

TUNA STUDIES CONTINUED:

M/V "Charles H. Gilbert" Cruise 69--Ahipalaha II (October 7-December 13, 1963): A study of the spawning seasons and spawning areas in the albacore fishing grounds of the South Pacific Ocean was the primary objective of this 10-week cruise by the U.S. Bureau of Commercial Fisheries research vessel Charles H. Gilbert. The purpose of the cruise is reflected in its designation, for "ahipalaha" is the Hawaiian name for albacore tuna. The first survey in this series was made in the spring of 1962.

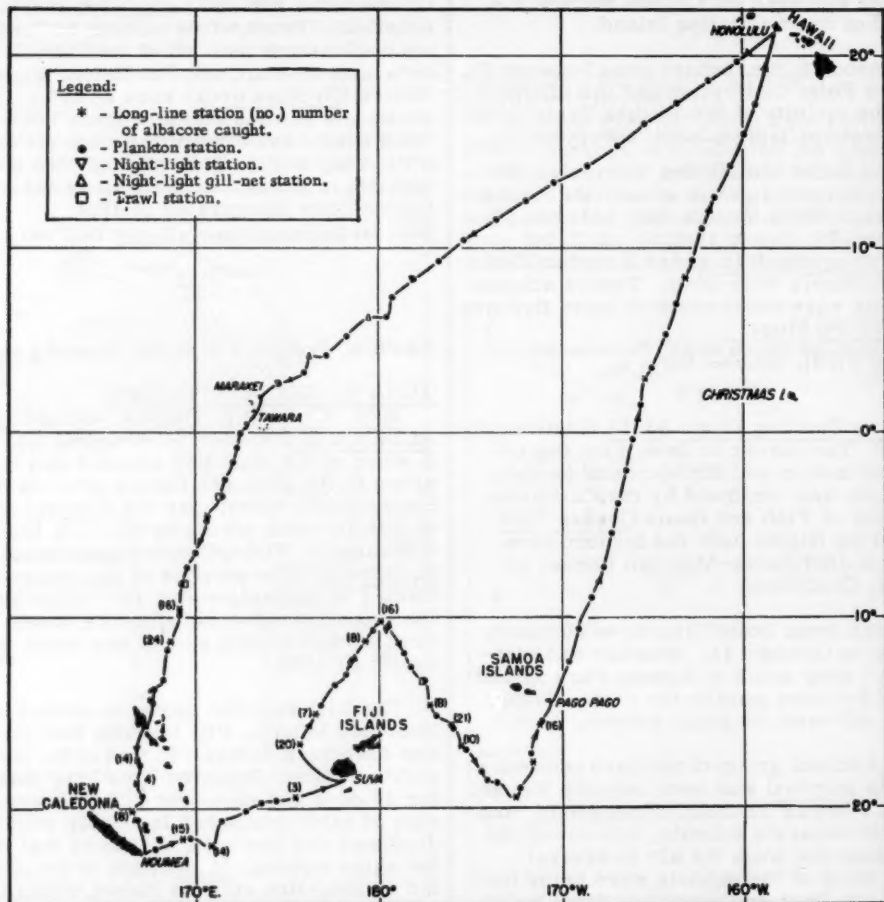
The investigation centered around the New Hebrides Islands, Fiji Islands, New Caledonia, and American Samoa. In that area, the expedition fished Japanese-type long-line gear for 19 days and took over 200 albacore. The rate of catch compared favorably with that of Japanese and Korean long-liners that work the same waters. In addition to the albacore, the 19 long-line stations fished within that area also yielded 21 yellowfin, 17 big-eyed, and 4 skipjack tuna, as well as 6 other tuna

which were damaged beyond recognition. Other species caught were: 10 spearfishes, 20 sharks, and 51 miscellaneous fish. The albacore (48 females, 147 males, and 9 unsexed) were generally large adults ranging in size from 85 to 108 centimeters (33.5 to 42.5 inches). Of the females, 21 percent had either spent or immature ovaries, 73 percent had maturing ovaries, and 6 percent had near-ripe ovaries, indicating that the albacore were not quite ready to spawn.

Scientists on the Charles H. Gilbert reported that the albacore were generally approaching a spawning condition, but were not quite ready to spawn. The expedition also made many hauls in the survey area with fine-

mesh nets designed to collect the young of tuna. Detailed laboratory study of the larval and juvenile specimens will provide a check on the information drawn from examination of adult spawners. The stomachs of large fish which prey on young tuna were also collected to provide an additional check on spawning information inferred from the examination of the adults.

Blood samples were collected from albacore, yellowfin, big-eyed, and skipjack tuna, and blue marlin. In addition, blood samples were collected from white-tip and great blue sharks. A sample of bloods was airshipped to the Bureau's Honolulu Laboratory from Suva, Fiji.



M/V Charles H. Gilbert, Cruise 69 (Ahipalaha II), October 7-December 13, 1963.

A total of 152 surface and 140-meter oblique plankton tows, three 6-foot Isaacs-Kidd trawl hauls, 8 night-light collections, and 4 small-mesh gill-net stations were made in order to capture larval and juvenile tunas. Gross examination of plankton samples at sea indicated the presence of a fair number of larval tunas. One juvenile tuna was caught by night-light fishing but nothing was taken by the small-mesh gill nets.

None of the tuna ovaries examined contained eggs in suitable condition for artificial fertilization. One sample of albacore eggs which was quite advanced in development, though not fully ripe, and measuring 0.88 to 1.06 millimeters (0.03 to 0.04 inches) in diameter, was fertilized, but due probably to unsuitable milt condition none of the eggs showed any sign of embryonic development. The milt used in this instance was quite thick and not freely flowing as those usually encountered in running ripe males.

One juvenile tuna of undetermined species about 4 centimeters (1.6 inches) long was caught at a night-light fishing station (latitude 08°10' N.; longitude 178°07' W.) on October 13. Shipboard rearing was not attempted because the juvenile tuna was in an extremely weakened condition.

Since emphasis was placed on the collections of data for serological and gonad condition studies, only a few albacore tuna were tagged. Seven albacore which were considered to be in good condition were tagged and released. Those albacore ranged in length from 89 to 99 centimeters (35 to 39 inches). In addition, three small yellowfin, 67 to 75 centimeters (26.4 to 29.5 inches) long, which came up in viable condition were tagged and released.

Other developments and observations during this cruise were as follows:

1. The condition of all albacore ovaries was noted. Although no ripe ovaries were encountered, a few ovaries were preserved for laboratory examination.

2. No ripe ovaries of other tunas or marlins were found.

3. Stomach contents of 128 fish were preserved.

4. Enough drift cards to make 34 releases were available for this cruise. These were

released with the first 35 bathythermograph (BT) observations.

5. The thermograph and barograph were operated continuously during the cruise.

6. A total of 197 weather observations were made at 0000, 0600, 1200, and 1800 G.C.T. daily and transmitted to the Weather Bureau whenever possible.

7. A total of 172 BT casts were made during the cruise. Surface salinity samples were collected with each BT cast.

8. Two lures were trolled during daylight hours. The catch consisted of only one dolphin.

9. During the cruise, 55 surface fish schools and bird flocks were sighted. Twelve were identified as skipjack tuna and 43 were unidentified.

10. All remoras found attached to fish and other objects were collected and brought back alive in the research vessel's bait tank, as requested by the University of Hawaii. The remoras will be used for physiological studies.

11. Flying fish that landed on deck were preserved.

12. Two long-line stations were fished in "big-eyed tuna waters," yielding only 2 big-eyed tuna, 2 yellowfin, 1 skipjack, 2 sharks, and 12 miscellaneous fish.

13. At Marakei Atoll, Gilbert Islands, a poison station was conducted to collect reef fishes for ichthyotoxism studies by a scientist of the University of Hawaii.

14. A participant scientist of the Agency for International Development (AID), studying tuna long-line fishing, completed the first phase of his training program aboard the Charles H. Gilbert. He disembarked at Pago Pago, American Samoa, to continue on the second phase of his training.

Note: See Commercial Fisheries Review, December 1963 p. 25.

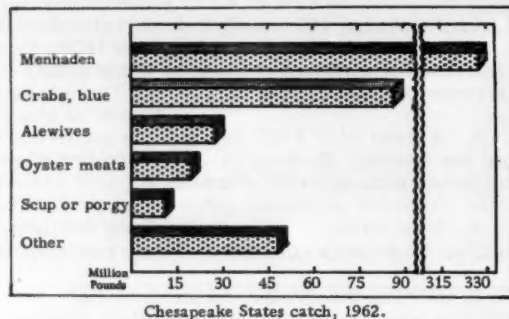


Chesapeake States

FISHERIES LANDINGS, 1962:

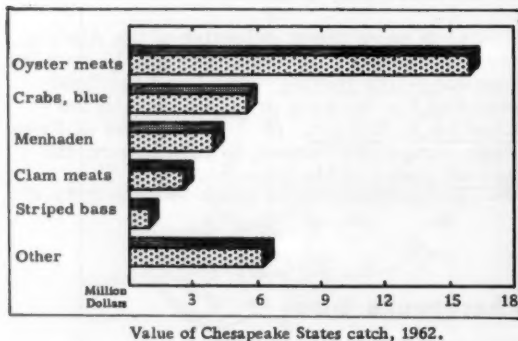
The 1962 commercial catch of fish and shellfish landed in the Chesapeake States

(Maryland and Virginia) totaled 521.5 million pounds valued at \$33.6 million ex-vessel. This was an increase of 43.6 million pounds or 9 percent but a decline of \$3.5 million (9 percent) compared with 1961.



The gain in quantity was due chiefly to menhaden landings of 327.9 million pounds--29.2 million pounds more than in 1961. The catch of hard blue crabs (81.3 million pounds) exceeded the peak production of 1950 by 7.4 million pounds and established a new record. The production of alewives (more than 27 million pounds) was up about 10 million, and there were moderate increases in production of sea bass, spot, white perch, and clams over the previous year. The yield of oyster meats (20 million pounds) declined 7.6 million pounds, while slighter decreases occurred in the catch of croaker and striped bass.

The decline in value resulted largely from reduced landings of high-priced oysters. The value would have dropped even



more except for the increased production of crabs and menhaden.

Virginia landings of 454 million pounds accounted for 87 percent of the total production in the Chesapeake States. Virginia also led in value of the catch with \$21.7 million or 65 percent of the total. The Maryland and Virginia catch was taken by 16,806 fishermen operating in 1,191 vessels of 5 or more net tons, 8,759 motor boats, and 1,045 other boats.



Films

NEW FILM ON OCEANOGRAPHY PRODUCED BY U. S. NAVY:

A new motion-picture film, "Oceanography--Science for Survival," was previewed by the Interagency Committee on Oceanography (ICO) on November 21, 1963. The film is in color, has a sound track, and runs 42 minutes. It was financed by the United States Navy and produced by the Naval Photographic Center.



This picture of an oceanographic survey ship under way is taken from the Navy's newest motion picture, "Oceanography--Science for Survival."

Early in 1964 the film will be distributed under the auspices of the ICO. The film gives an excellent, fast-moving account of Government oceanography activities, including those of the U. S. Bureau of Commercial Fisheries. It begins and ends with scenes

in which the late President Kennedy speaks in behalf of a strong National Oceanographic Program. The work of the Federal Council for Science and Technology and of the ICO in coordinating the oceanographic program is strongly emphasized. The film serves a useful purpose in explaining oceanography to Members of Congress, to students, and to the public in general.



Fish Farming

SLAT TRAPS TESTED FOR HARVESTING FISH PONDS:

To determine their effectiveness for catching small numbers of catfish on short notice, slat traps were tested in the fall of 1963 in an Arkansas fish pond. The testing was done by gear experts of the U. S. Bureau of Commercial Fisheries. An apparent relationship to the catch rate was the decoying effect of early-caught catfish attracting others to the same trap. One fairly high catch of 121 pounds of channel catfish made during a 48-hour set emphasized the decoying effect. Over one-half of the fish were reported taken by one of the 10 traps set, and it was jammed so full that one more fish could not have forced itself through the opening. This behavior is successfully used in other fresh-water fisheries and Bureau personnel will continue to study it in future slat-trap fishing tests.



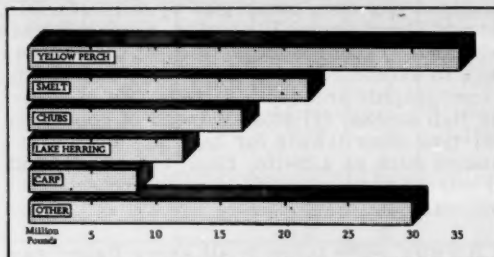
Great Lakes

FISHERIES LANDINGS, 1962:

The 1962 United States and Canadian commercial catch of fishery products in the Great Lakes, Lake St. Clair, and the International Lakes of northern Minnesota amounted to 123.4 million pounds. The catch was 3 million pounds more than in 1961, with domestic landings accounting for slightly more than half of the total volume.

From those lakes in 1962, United States fishermen took 65.6 million pounds of fish valued at \$5.5 million. The quantity declined 5 million pounds (7 percent) and the value, \$1.4 million (21 percent) compared with 1961. The reduction in value resulted largely from increased landings of low-priced fish taken

for industrial use and a decline in the catch of fish taken for human food.



United States and Canadian catch, 1962.

United States landings of sheepshead, chubs, and lake herring declined sharply in 1962 and slighter decreases occurred in the production of smelt, white bass, catfish, yellow pike, carp, common whitefish, and suckers. There was a substantial increase in the catch of yellow perch and alewives during 1962 while tullibee landings were up slightly compared with the previous year.

The State of Michigan led in production with a catch of over 22 million pounds--a loss of more than 2 million compared with 1961. Wisconsin was next with landings totaling 19 million pounds (down nearly 3 million from 1961), while Ohio was in third place with a catch of 15 million pounds--slightly less than a year earlier.

For the third successive year, Lake Michigan was the leading contributor to the United States catch with a take of 23.5 million pounds--down 2 million from 1961. Lake Erie was second with 19.7 million pounds, followed by Lake Superior with landings of 12.6 million pounds. The Lake Erie production was about the same as the previous year but the Lake Superior catch fell 2 million pounds below the 1961 level. Catches in the remaining lakes showed little change compared with 1961.



Great Lakes Fisheries

Exploration and Gear Research

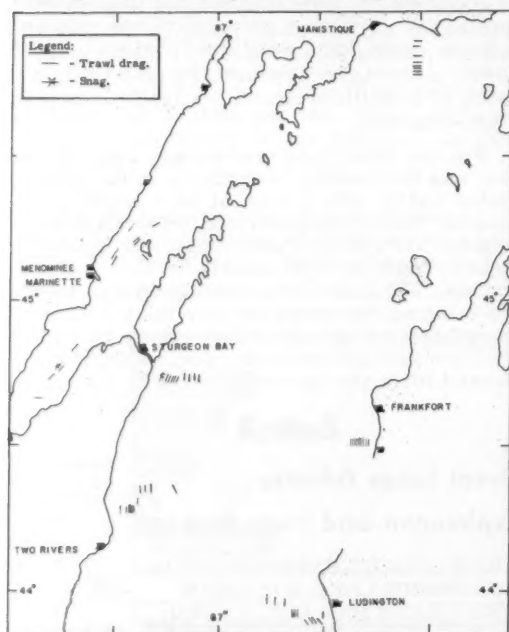
TRAWLING INVESTIGATIONS IN NORTHERN LAKE MICHIGAN AND GREEN BAY CONTINUED:

R/V "Kaho" Cruise 14 (October 23-November 25, 1963): The fourth in a series of cruises

to determine the commercial feasibility of otter trawling in Green Bay and northern Lake Michigan has been completed by the U. S. Bureau of Commercial Fisheries research vessel Kaho. Technical objectives of the cruise were to extend seasonal knowledge concerning (1) geographic and depth distribution of various fish stocks, (2) effectiveness of commercial-type otter trawls for catching abundant species such as alewife, chub, and smelt, and (3) effects of trawling on certain protected species.

Alewife were taken in all areas fished except off Frankfort, and chubs were taken in all areas fished except in Green Bay and off Manistique. Although the four cruises have provided good indications that trawling is feasible in these waters, production rates have been somewhat smaller and species composition of catches is different from that experienced in the lower end of Lake Michigan.

A portion of the time originally scheduled for this cruise was utilized for a short survey in the Whitefish Bay area of Lake Superior in an effort to determine the suitability of otter-trawl gear for taking lake herring (cisco).



Lake Michigan explorations R/V Kaho Cruise 14 (October-November, 1963).

A total of 65 drags was made with a 52-foot (headrope) Gulf of Mexico type fish trawl during 17 days of operation. Twelve drags were made in Green Bay and 53 were made at 5 stations in Lake Michigan proper. Depths fished ranged from 4 fathoms in Green Bay to 80 fathoms in Lake Michigan.

All drags were of 30 minutes except for three shorter ones in Green Bay which included one that hung up and two that were terminated when set nets were encountered and one other drag in Green Bay which lasted 80 minutes.

Bottom topography and bathymetric distribution of fish were continuously recorded with a high-resolution, "white-line" type depth recorder. Obvious rough bottom areas were avoided during the cruise, and relatively minor gear damage was experienced during only two drags.

FISHING RESULTS, GREEN BAY: Two catches of alewife--800 and 900 pounds--were taken at 4 and 5 fathoms in the southern end of the bay (see table 1). Four catches of alewife, ranging from 480 to 625 pounds, were made at depths of 10, 12, and 20 fathoms just north of Menominee. Significant individual catches of smelt, spottail shiner, carp, and sucker of 320, 125, 85, and 50 pounds, respectively, were taken in separate drags. Other than the above, the catches included

Table 1 - Summary of Catch Rate and Species Composition Resulting from 30-Minute Trawl Drags at Stations in Green Bay

Depth (Fms.)	Green Bay--South of Menominee						Total Pounds Caught
	Alewife		Smelt		Other Species		
	Pounds Caught	% of Catch	Pounds Caught	% of Catch	Pounds Caught	% of Catch	
4	800	86	1/Tr.	-	2/125	14	925
5	900	96	Tr.	-	40	4	940
7	-	-	-	-	-	-	3/
7	Tr.	-	Tr.	-	4/285	100	5/285
9	100	100	-	-	Tr.	-	5/100
Green Bay --North of Menominee							
10	530	100	Tr.	-	Tr.	-	6/530
12	480	97	15	3	Tr.	-	495
12	625	99	5	1	Tr.	-	630
12	100	100	Tr.	-	Tr.	-	100
19	160	80	40	20	-	-	200
20	150	83	30	17	-	-	180
20	480	60	320	40	Tr.	-	800

1/Tr. - trace, less than 1 pound.

2/Includes: 85 lbs. carp, 33 lbs. yellow perch, 7 lbs. sucker.

3/Snagged, tore net.

4/Includes: 190 lbs. spottail shiner, 75 lbs. sucker, 20 lbs. yellow perch.

5/Terminated drag in less than 30 minutes when gill nets were encountered. Catch figures equated to 30-minute period.

6/Equated to 30-minute period--actual catch was 1,400 lbs. in 80-minute drag.

Table 2 - Summary of Catch Rate and Species Composition Resulting from 30-Minute Trawl Drags at Certain Stations in Wisconsin Waters of Northern Lake Michigan

Area	Nearest 5-Fathom Depth Interval	Alewife		Small Chubs		Large Chubs		Other Species		Total Pounds Caught
		Pounds Caught	% of Catch	Pounds Caught	% of Catch	Pounds Caught	% of Catch	Pounds Caught	% of Catch	
Two Rivers	10	-	-	-	-	-	-	-	-	-
	15	985	98	7	1	2	-	6	1	1,000
	20	700	93	20	3	1	-	1/29	4	750
	25	500	61	260	32	10	1	1/50	6	820
	30	400	52	275	36	14	2	1/76	10	765
	35	100	9	930	84	30	3	1/50	4	1,110
	2/40	-	-	-	-	-	-	-	-	-
	45	3/Tr.	-	300	98	5	2	Tr.	-	305
	50	Tr.	-	150	96	2	1	5	3	157
	60	-	-	100	82	2	2	4/20	16	122
Sturgeon Bay	70	-	-	40	33	2	2	4/80	65	122
	80	5	13	10	25	-	-	4/25	62	40
	5/10	-	-	-	-	-	-	-	-	-
	15	700	97	1	-	-	-	1/24	3	725
	20	400	84	40	8	20	4	1/20	4	480
	25	600	61	250	26	30	3	1/100	10	980
	30	200	50	150	37	5	1	1/50	12	405
	35	150	25	400	67	12	2	1/38	6	600
	40	20	6	250	81	8	3	1/32	10	310
	45	Tr.	-	220	98	5	2	Tr.	-	225
	50	Tr.	-	100	89	2	2	4/10	9	113
	60	-	-	80	36	-	-	4/140	64	220
	70	-	-	15	33	-	-	4/30	67	45

1/Mostly smelt.

2/No effort--rough bottom conditions.

3/Tr. - trace, less than 1 pound.

4/Mostly sculpin.

5/Cod end damaged--no fish caught.

Table 3 - Summary of Catch Rate and Species Composition Resulting from 30-Minute Trawl Drags at Certain Stations in Michigan Waters of Northern Lake Michigan

Area	Nearest 5-Fathom Depth Interval	Alewife		Small Chubs		Large Chubs		Other Species		Total Pounds Caught
		Pounds Caught	% of Catch	Pounds Caught	% of Catch	Pounds Caught	% of Catch	Pounds Caught	% of Catch	
Ludington	10	40	98	1/Tr.	-	-	-	1	2	41
	15	275	92	10	3	4	1	11	4	300
	20	650	70	250	27	14	2	11	1	925
	25	250	28	600	68	25	3	10	1	885
	30	100	9	1,000	88	30	3	Tr.	-	1,130
	35	50	8	550	90	9	2	1	-	610
	40	-	-	370	97	10	3	-	-	380
	45	-	-	370	99	5	1	Tr.	-	375
	50	-	-	270	88	5	2	2/30	10	305
	60	Tr.	-	100	67	5	3	2/45	30	150
Frankfort	70	Tr.	-	30	65	1	2	2/15	33	46
	80	-	-	20	57	-	-	2/15	43	35
	20	Tr.	-	170	85	29	15	1	0	200
	25	Tr.	-	335	86	54	14	1	0	390
	30	Tr.	-	1,100	98	19	2	1	0	1,120
	35	Tr.	-	630	96	24	4	1	0	655
	40	-	-	605	92	20	3	2/35	5	660
	45	-	-	540	89	20	3	2/45	8	605
	50	-	-	245	91	20	7	5	2	270
	60	-	-	500	84	15	3	2/80	13	595
Manistique	70	-	-	90	34	5	2	2/170	64	265
	80	-	-	10	5	-	0	2/200	95	210
	10	23	70	1	3	-	-	9	27	33
	15	41	57	2	3	3	4	3/26	36	72
	20	385	79	7	1	7	1	3/91	19	490
	25	360	84	45	11	16	4	4	1	425
	30	36	16	170	74	22	9	2	1	230
	35	23	11	180	84	11	5	1	-	215
	40	12	8	120	86	7	5	1	1	140
	45	35	21	125	73	6	4	4	2	170
	50	250	75	70	21	10	3	5	1	335

1/Tr. - trace, less than 1 pound.

2/Mostly sculpin.

3/Mostly smelt.

very small quantities of bullheads, burbot, lake herring, sculpin, trout-perch, whitefish, and yellow perch.

FISHING RESULTS, WISCONSIN WATERS OF LAKE MICHIGAN: Good to excellent catches of alewife, ranging from 400 to 985 pounds, were taken at 15, 20, and 25 fathoms in both areas fished and also at 30 fathoms off Two Rivers (see table 2). One large catch of chubs (960 pounds) was taken at 35 fathoms off Two Rivers. Other significant catches of chubs were obtained at 25 to 45 fathoms in both areas. Smelt and sculpins were the most common other species taken.

FISHING RESULTS, MICHIGAN WATERS OF LAKE MICHIGAN: The best catch of alewife made in Michigan waters was 650 pounds taken at 20 fathoms off Ludington. Fair catches were made at 20 and 25 fathoms off Manistique (see table 3). There is evidence that the 250 pounds of alewife taken in 50 fathoms off Manistique were caught from midwater concentrations as the net was being set or hauled. Very good catches of chubs, ranging from 515 to 1,120 pounds, were taken at 25, 30, and 35 fathoms off Ludington and at 30, 35, 40, 45, and 60 fathoms off Frankfort. Smelt and sculpins accounted for most of the other fish taken in these waters.

HYDROGRAPHIC DATA: Thirty-six bathythermograph casts were made, and air and surface water temperatures were recorded continuously. Surface water temperatures ranged from 56°-57° F. off Ludington early in the cruise to 45°-46° F. off Manistique late in the cruise.

TRAWL GEAR TESTED FOR CATCHING LAKE HERRING IN EASTERN LAKE SUPERIOR:

R/V "Kaho," Special Cruise, November 16-20, 1963: As part of the U. S. Bureau of Commercial Fisheries program to assist the Great Lakes fishing industry adjust to changing conditions, a preliminary exploratory cruise in the Whitefish Bay area of Lake Superior was conducted by the Bureau's research vessel Kaho. Fishing industry members had requested that trawl fishing gear be tested for catching lake herring when they are concentrated during the spawning season and most readily available. Usually at that time of year, prices for lake herring drop to a level that makes production with the traditional gill-net fishing

gear marginal. It is felt that trawling may prove to be an economical method under those conditions. The Michigan Department of Conservation cooperated fully in the operation.

It was not expected that a thorough investigation could be completed in a 5-day period. However, in spite of the slim chances for attaining success during the brief survey, the collection of general information in respect to bottom conditions and fish distribution in the Whitefish Bay area will be helpful in planning future Lake Superior operations.

Although lake herring fishing was the primary consideration this cruise, other information was gathered as follows: (1) seasonal abundance and distribution of various species, (2) commercial availability of all species to otter trawls, and (3) delineation of areas suitable for otter trawl fishing.

Fair catches of alewife and chub were taken in bottom trawls at depths greater than 30 fathoms. Smelt appeared to be widely scattered at depths between 20 and 38 fathoms, and those of salable size were caught in only small amounts. Lake herring, lake trout, and whitefish trawl catches were insignificant. Concentrations of lake herring near the surface were not located.

Seventeen trawl drags were made with a 52-foot (headrope) Gulf of Mexico-type fish trawl. Although efforts were made to keep each drag at a uniform depth, this was not always possible due to the uneven bottom topography. All trawl drags were of 30 minutes' duration, except 2, which were terminated when the net became fouled on bottom obstructions.

Commercially significant catches of chubs and alewife were taken at several localities in eastern Lake Superior. The best catch of chubs, 305 pounds, was obtained north of Whitefish Point at 34-36 fathoms. Alewife were taken in 6 drags and appeared to be most abundant in southern Whitefish Bay, where one drag yielded 200 pounds.

Herring apparently were either scarce or had not as yet concentrated prior to spawning because of the unseasonable mild weather this year. Only a few individuals were taken at 6 stations during the survey. Lake trout, both native and planted, appeared in 4 catches in amounts of 6 pounds or less. Two trawl drags

in depths of 20-21 and 32-34 fathoms yielded whitefish in amounts of $5\frac{1}{2}$ and 5 pounds, respectively.

Smelt appeared to be widely dispersed throughout Whitefish Bay. Ten stations yielded smelt in amounts of 15 pounds, or less, however, most catches were small individuals (40 or more per pound).

Miscellaneous species appearing in very small numbers in the trawl catches were: pigmy whitefish, round whitefish, sculpin, spottail shiner, stickleback, and trout-perch.

Continuous echo-sounding (using a Kelvin Hughes MS-28 echo-sounder--30 kc/s, pulse

length 1 to 3 milliseconds) was carried on during both cruising and fishing operations. Although the Kaho cruised over 250 statute miles in and near Whitefish Bay, no surface or extensive midwater concentrations of fish were located. Near bottom concentrations of fish were noted at various depths beyond 15 fathoms. The survey revealed a bottom configuration inconsistent in form and composition. In general, shoal areas display highly irregular bottom topography while, beyond 10 fathoms, the slope becomes very steep until maximum depths are reached. A fair amount of good trawling bottom was located in the southern reaches of Whitefish Bay and north of Whitefish Point.

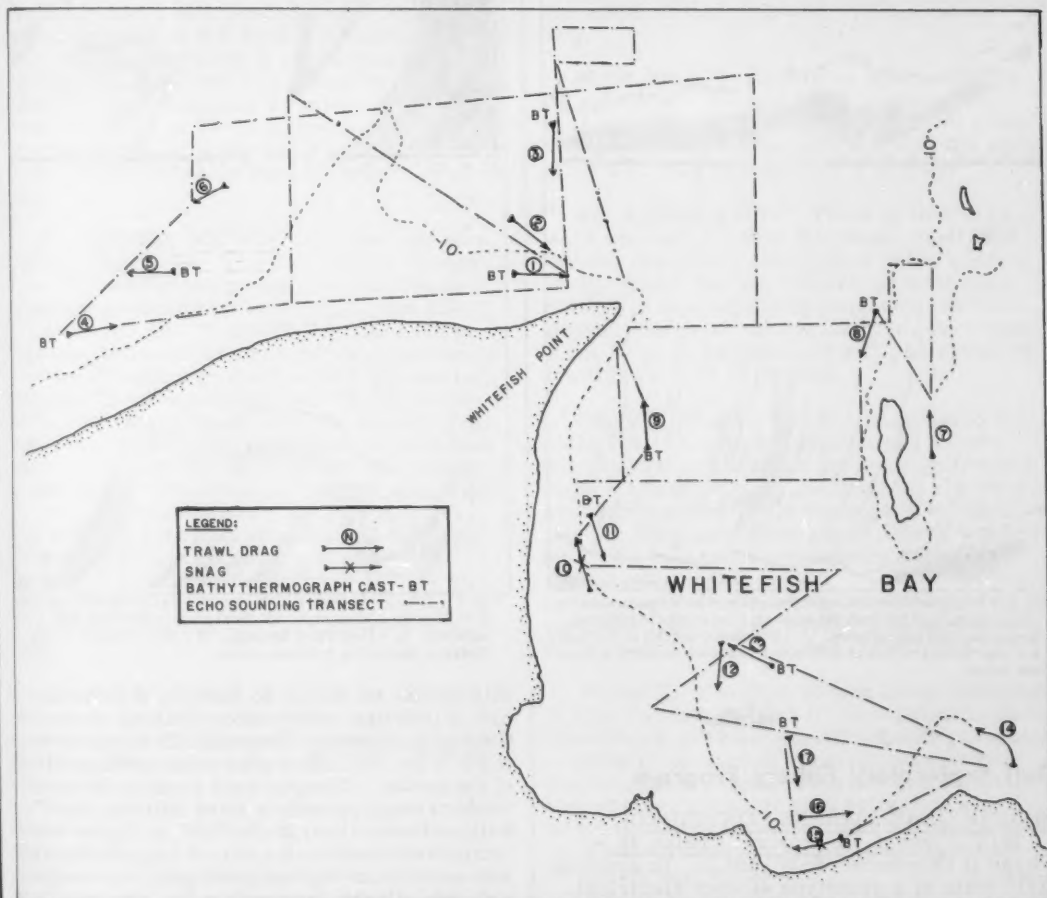


Fig. 1 - R/V Kaho Lake Superior explorations (November 16-20, 1963).

Ten bathythermograph casts were made at various stations to determine verticle thermal gradients. Surface water temperature ranged from 45.0° F. to 46.0° F. Bottom temperature

ranged from 45.0° F. at depths less than 28 fathoms to approximately 39.0° F. at depths of 36 fathoms.

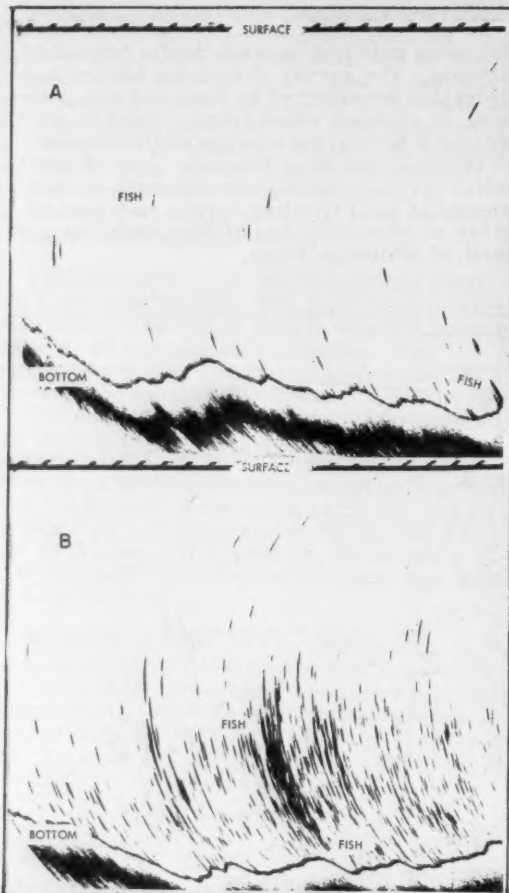


Fig. 2 - Echograms from a high-resolution echo-sounder showing concentrations of fish from the same area and depth (36 fathoms) during daylight and darkness. A - Distribution of fish at 8:30 a.m. B - Distribution of fish at 6:30 p.m. Distance covered is 4 statute miles.

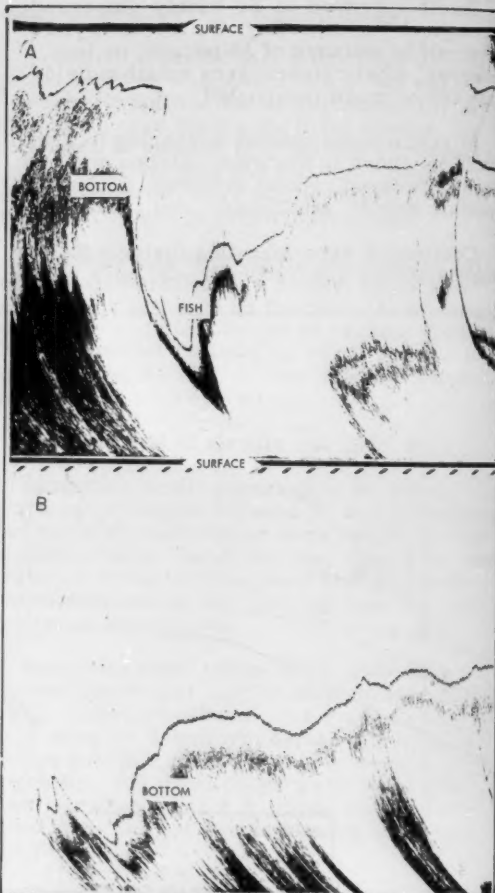


Fig. 3 - Echograms from a high-resolution echo-sounder showing typical bottom topography off shoal areas in Whitefish Bay, Lake Superior. A - Near Point Iroquois. B - Near Pendell Creek. Distance covered is 4 statute miles.

Gulf Exploratory Fishery Program

SHRIMP GEAR STUDIES CONTINUED:

M/V "George M. Bowers" Cruise 48-- Phase II (November 6-27, 1963): To continue field tests of a prototype 40-foot electrical shrimp trawl was the purpose of Phase II of

this cruise by the U. S. Bureau of Commercial Fisheries exploratory fishing vessel George M. Bowers. Two modifications were made to the electrical gear prior to Phase II of the cruise. Changes were made in the electrode array to provide a more efficient distribution of electricity in the field, using the existing electrical equipment. Also, provision was made for using two pulse units on a single net, effectively increasing the electrical strength at the net. The specific objectives

28
ths

of Phase II were to determine the effectiveness of the modified electrical gear as compared with the equipment used during Phase I of cruise 48.

METHOD OF OPERATION: A 40-foot flat trawl with 6-foot by 32-inch doors rigged with a tickler chain was fished on the starboard outrigger. The electrical trawl was fished simultaneously on the port side. The two nets were set and hauled at the same time and fished with identical warplengths. Drags were of one hour duration. Tests were conducted at night and during the day. The night tests were primarily to establish the approximate quantity of shrimp available in the area.

AREA OF OPERATIONS: Comparative trawling tests were conducted off Florida in the same area of the Apalachicola-Carrabelle area as during Phase I; specifically, in St. George Sound behind Dog Island in 3 fathoms, offshore approximately 15 miles southeast of Cape San Blas in 10-12 fathoms, and immediately south of St. Vincents Island in 4-5 fathoms. Tests were also conducted in St. Andrew Bay.

ST. GEORGE SOUND: Only one day was spent in that area. The only known change from the conditions present during Phase I was a drop in bottom temperature from 23° C. (73.4° F.) to 19° C. (66.2° F.). Results in this area followed the same general pattern as previously, although there were fewer shrimp present. Night drags yielded 15-20 pounds of pink shrimp per hour, with the electric gear again catching slightly more than the standard gear. The daytime catches with the electric trawl ranged from 6.5 to 11 pounds, compared to 3.5 to 4.5 pounds for the standard gear. The ratio of electric to standard catch per drag ranged from 1:5 to 2:1. The same factors were apparent as in Phase I. The electric gear produced more shrimp during daylight hours, but not as many as were available.

OFFSHORE CAPE SAN BLAS: Conditions were essentially the same during this phase, with the exception of water temperature, which had declined several degrees.

Night catches in this area dropped from 20 pounds the first night to 7 pounds on all following night tows. Daytime catches with the electric trawl ranged from several individuals to 4.5 pounds. The standard trawl usually produced no shrimp, but on one occasion 0.5

pound was caught. Attempts were made on several drags to slow the bottom speed and also to drag at an angle to the bottom contours and prevailing current. Weather and bottom conditions made it impossible to secure enough information to draw any conclusions.

ST. VINCENTS ISLAND: Physical conditions in the area were: bottom type--brown mud; water (surface)--green, turbid; bottom salinity--35.6-35.9 parts per thousand; bottom temperature--17.0° C.-17.5° C. (62.6°-63.5° F.). The electrode array used on drags in the area was modified by using two pulse generators simultaneously. Each pulse generator powered one-half of the electrodes. This provided a pulse of approximately twice the width of that obtained with a single power unit.

Night drags here yielded approximately 18 pounds per hour of white shrimp. Daytime catches with the electrical trawl ranged from 13 to 27 pounds; catches with the standard trawl ranged from 2 to 8 pounds.

ST. ANDREW BAY: Tests in this area were carried out with the same electrical system described above (dual pulse generators). Night fishing yielded pink shrimp catches of approximately 14 pounds per hour. Daytime catches with the electric gear ranged from 14 to 21 pounds, and with the standard trawl from 9 to 12 pounds.

CONCLUSIONS: The modification to the electrical system which produced a more uniform electrical field did not significantly improve catches over the original electrical system on either the soft or hard bottoms. But the increased strength of pulses achieved by using dual pulse generators appeared to produce the result sought, i.e., the electric trawl caught what shrimp were available. However, due to the limited testing, the results cannot be considered conclusive.

Phase III of cruise 48 was to be conducted during December 1963 in the Apalachicola-Carrabelle area using another pulse generator capable of producing various pulse widths and/or peak voltages. This unit should establish whether a greater peak voltage or a longer pulse than that used to date will successfully and consistently stimulate 100 percent of the shrimp available.

M/V "George M. Bowers" Cruise 48--Phase III (December 4-14, 1963): This Phase continued experimentation with the Bowers electrical shrimp trawl. Following Phase II, modifications were made to the electrode array to reduce line loss and a new pulse generator was acquired. This unit is capable of producing a much greater field strength than previously possible and is also capable of producing pulse characteristics not attainable with previous gear.

The primary objective of this phase was to determine whether or not inadequate field strength was the principal reason for reduced effectiveness of the electrical trawl on the offshore grounds. Bad weather severely limited tests on the offshore grounds; consequently tests were not as comprehensive as desired.

AREA OF OPERATIONS AND METHODS: Three areas were worked; (1) southeast of Cape San Blas in 10 fathoms, (2) immediately south of St. Vincents Island in 4 fathoms, and (3) in St. George Sound behind Dog Island. The latter two areas were worked when weather conditions precluded operations offshore. The experimental methods were the same as used during Phases I and II.

OFFSHORE CAPE SAN BLAS: The pink shrimp density, as indicated by night trawling here, was approximately 20 percent of that during Phase I, i.e., $4\frac{1}{2}$ pounds per hour per trawl (starboard and port trawls fished simultaneously) versus 22 pounds per hour. This was accompanied with significant changes in water temperature and general catch composition.

Daytime catches with the electric trawl ranged from $5\frac{1}{2}$ pounds to 7 pounds; with the standard gear from 0 to $1\frac{1}{4}$ pounds. Night catches with both trawls were 4 to $4\frac{1}{2}$ pounds.

ST. VINCENTS ISLAND: Catches of white shrimp both day and night in this area were too erratic to allow evaluation of the effect of the electrical gear. This was due probably to "schooling," vertical movements, burrowing behavior, or all three.

ST. GEORGE SOUND: Bottom temperature was down to 13° C. (55.4° F.) and the night catch density was down to 14 pounds per hour early in the trip and to 6 to 7 pounds at the end of the trip. Earlier work here yielded 30 pounds per hour. Day catches with the electric trawl ranged from 4 to 14 pounds per hour and

with the standard trawl from $\frac{3}{4}$ to $4\frac{3}{4}$ pounds. In all day tows the electric gear produced significantly greater catches than the standard gear.

DISCUSSION OF RESULTS: Results obtained during Phase III indicate the improved electrical characteristics achieved with the new pulse generator and electrode array produced daytime catches equal to or greater than night catches with the standard trawl. However, quantitative evaluation is difficult due to the changes in environment. These changes produced known reduction in shrimp density and unknown variations in their behavior patterns.

CRUISE 49: This cruise was scheduled for the Tortugas shrimp grounds during January-February 1964 to verify cruise 48 results on commercial concentrations. In addition to providing greater shrimp concentrations, the Tortugas grounds will provide a more stable environment than that which has existed in the Apalachicola-Carrabelle area recently. This should facilitate evaluation of results. Also, tests will be conducted with the electrode array built into the trawl. To date, the array has been operated separately in the manner of a tickler chain.

Note: See Commercial Fisheries Review, December 1963 p. 12.

SURVEY OF SEASONAL DISTRIBUTION OF ROYAL-RED SHRIMP CONTINUED:

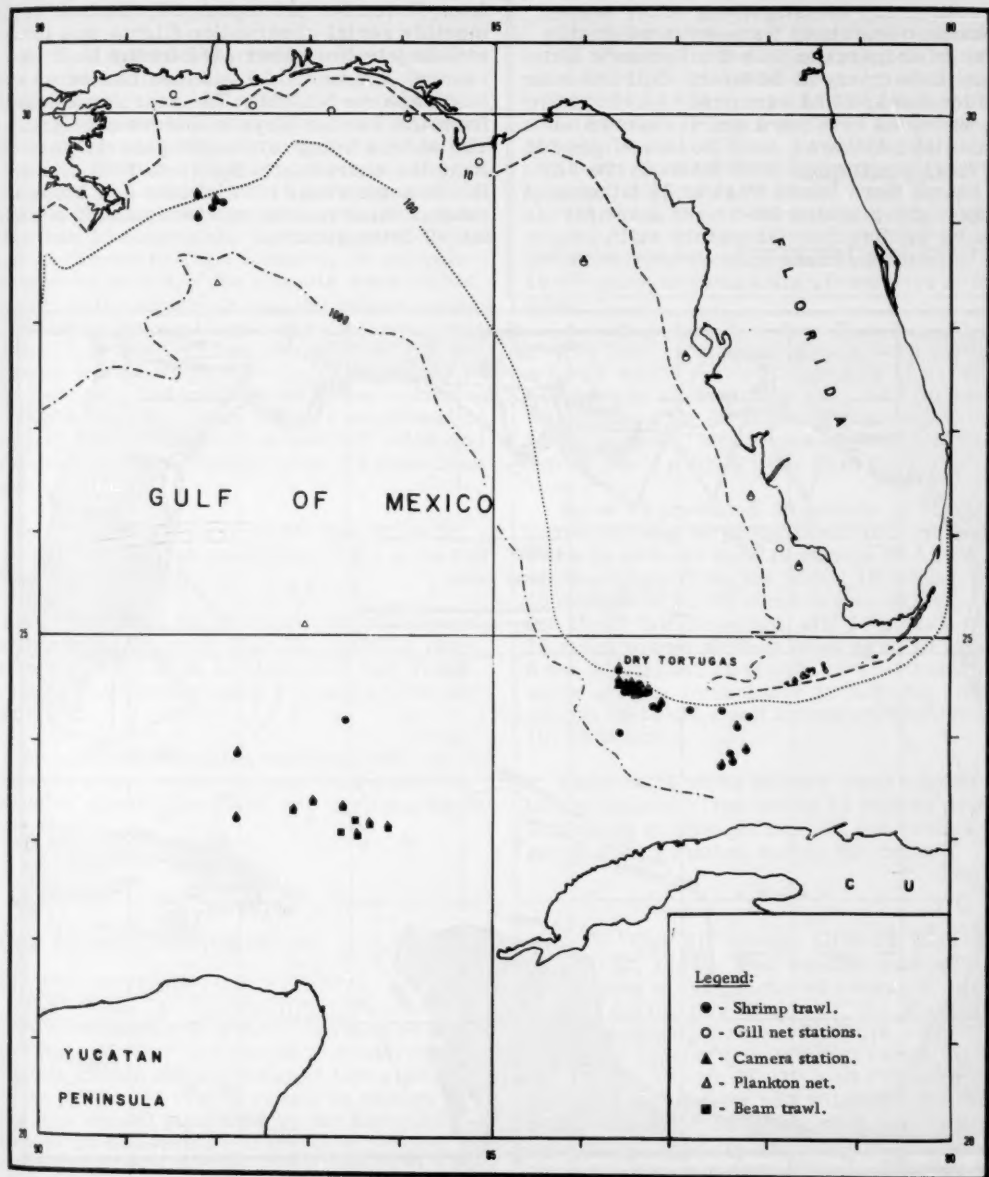
M/V "Oregon" Cruise 88 (November 18-December 13, 1963): To obtain seasonal data on the availability of royal-red shrimp *Hy-menopenaeus robustus* in the Tortugas area and to conduct deep-water faunal transects in the Florida Straits, off the northeast coast of Yucatan, and off the Mississippi River Delta, were the principal objectives of this 26-day cruise by the U.S. Bureau of Commercial Fisheries exploratory fishing vessel Oregon.

Shrimp catches were extremely light compared with previous efforts in the Tortugas area. A total of 28 drags yielded slightly over 1,200 pounds of shrimp (heads on) compared with some 5,000 pounds in 31 drags on the same grounds in August 1963. Previously established optimum bottom temperatures for royal-red shrimp fishing (49° - 51° F.) occurred over a more extensive depth range than usual--from 190 to 235 fathoms. Several hundred feet of still and movie film, exposed in the red shrimp depth range, will be studied closely for indications of lowered

shrimp density as well as for gear performance.

Faunal transects were conducted in the Florida Straits and on the northeastern slope

of Yucatan at 100 fathom intervals to 800 fathoms. A 10-foot beam trawl was used when bottom conditions were unsuitable for shrimp trawls. The scheduled transect off the Mississippi River Delta was only extended to 500



M/V Oregon Cruise 88 (November 18-December 13, 1963).

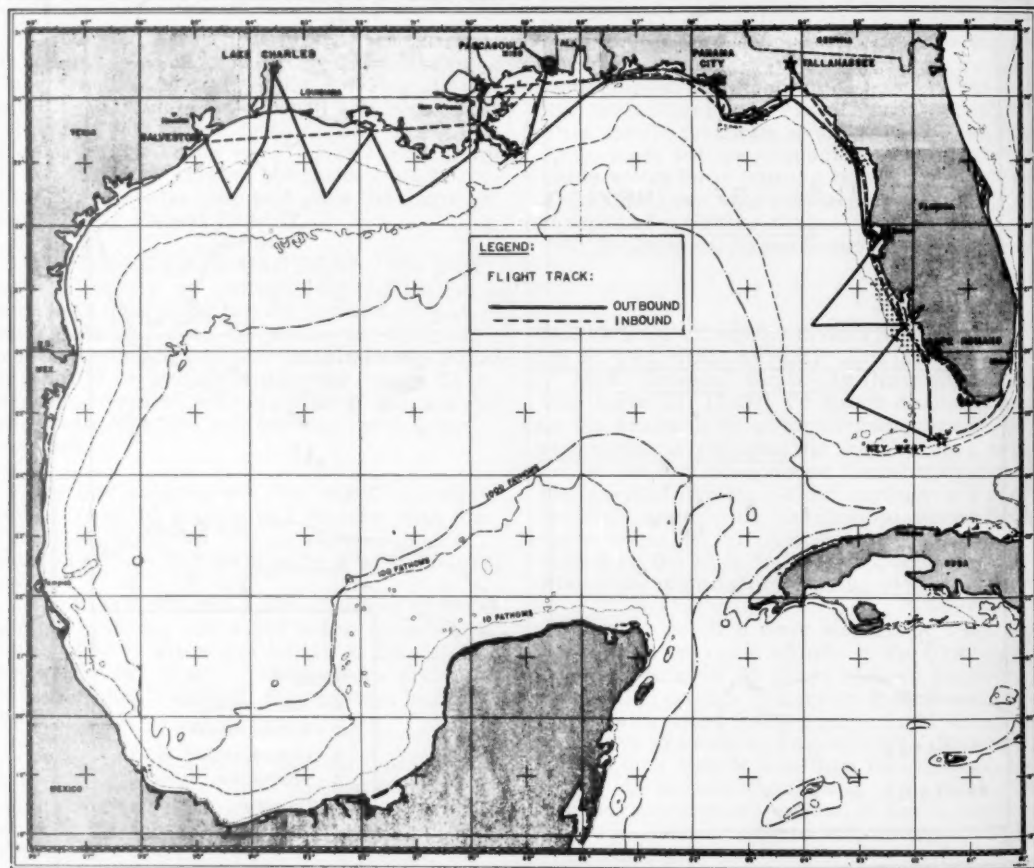
fathoms due to wire losses on the Yucatan slope. Rattail fishes (*Macrouridae*) predominated the transect catches; other faunal elements were represented by several rare specimens, especially along the Yucatan slope.

Preliminary investigations on off-season menhaden occurrence were initiated on this cruise in cooperation with the Bureau's Biological Laboratory at Beaufort. Gill-net sets (surface and bottom) were made at 10 localities, in depths between 4 and 62 fathoms off Mississippi, Alabama, and Florida. Menhaden (*Brevoortia patronus*) were taken in one bottom set off Horn Island Pass in 7½ fathoms. Thirty-eight plankton tows were made for study by the Beaufort laboratory staff.

Note: See *Commercial Fisheries Review*, November 1963 p. 34.

MENHADEN OFF-SEASON POPULATION SURVEY:

Airplane Spotting Flight 1 (November 19-22, 1963): To determine the occurrence of adult menhaden and related species in the Gulf of Mexico during the off-season period from November through April, the first of six monthly aerial observation flights was initiated in late November 1963 by the U. S. Bureau of Commercial Fisheries chartered airplane Apache N2229P. The search zone is from the Florida Keys to Galveston, Tex. The waters being canvassed generally extend from the shoreline to the 20-fathom curve. But in some areas off Alabama and Louisiana, coastal observations will be extended out to the 50-fathom curve.



Menhaden airplane spotting Flight No. 1.

During the initial flight heavy seas off Mississippi, Louisiana, Texas, and the west coast of Florida limited the effectiveness of aerial observations. In addition, low ceilings and overcast skies interfered with observations between Galveston and the Mississippi River Delta on November 22.

Surface menhaden schools were sighted in three areas off the Florida coast. In the Apalachicola area, 31 schools were observed, ranging in estimated size from 1 to 20 tons; although the majority were considered to be less than 10 tons. In waters west, southwest, and south of Cedar Keys, 16 schools were sighted. Those schools were estimated to be less than 10 tons each. In the area off Venice and southward to Cape Romano, 36 schools were observed; 3 of the schools were within 1 mile of the shoreline and the others ranged offshore as far as 12 miles, with the majority in the 2- to 4-mile zone. Most of those schools were estimated to be in the 10- to 15-ton category, but 2 schools 3 miles northwest of Naples and 2 schools 5 miles southwest of Venice, showed distinctive reddish color and were estimated to contain from 25 to 50 tons each.

In all three areas in which fish schools were observed, sea conditions were good and birds were present.

United States shrimp and snapper vessels were seen fishing off Florida. Shrimp vessels were also seen in Louisiana and Texas waters. No foreign fishing vessels were observed.

An infrared radiation thermometer to record surface water temperatures will be installed aboard the plane and used during future flights.



Gulf Fishery Investigations

SHRIMP DISTRIBUTION STUDIES:

M/V "Gus III" Cruise GUS-11 (November 20-December 2, 1963): Catches of brown and white shrimp were light to moderate during this cruise off the coast of Louisiana and Texas by the chartered research vessel Gus III. The vessel (operated by the Galveston Biological Laboratory of the U.S. Bureau of Commercial Fisheries) was engaged in a continuing study of the distribution of shrimp in

the Gulf of Mexico. Eight statistical areas (13, 14, 16, 17, 18, 19, 20, and 21) were covered. One 3-hour tow with a 45-foot shrimp trawl was made in each of 3 depth ranges (0-10, 10-20, and over 20 fathoms) in those areas.

The best catches off Louisiana were taken in the vicinity of the Mississippi Delta which yielded 73 pounds of 26-30 count white shrimp from under 10 fathoms and 37 pounds of 21-25 count brown shrimp from over 20 fathoms. Moving westward, area 14 yielded 28 pounds of 31-40 count white shrimp from under 10 fathoms, 15 pounds of 21-25 count brown shrimp from the 10-20 fathom depth, and 11 pounds of 15-20 count brown shrimp from over 20 fathoms; area 16 produced 17 pounds of 15-20 count brown shrimp from over 20 fathoms.

The best catches off Texas were made in area 18 which yielded 24 pounds of 31-40 count white shrimp from under 10 fathoms, 14 pounds of 26-30 count brown shrimp from 10-20 fathoms, and 56 pounds of 12-15 count brown shrimp from over 20 fathoms.

Area 19 produced 39 pounds of 15-20 count brown shrimp from the 10-20 fathom range. Tows in area 20 took 10 pounds of 31-40 count white shrimp from the under 10-fathom depth, 19 pounds of 21-25 count brown shrimp from the 10-20 fathom range, and 29 pounds of 15-20 count brown shrimp from over 20 fathoms. Area 21 yielded 11 pounds of 26-30 count white shrimp from under 10 fathoms and 15 pounds of 15-20 count brown shrimp from 10-20 fathoms.

Catches of white shrimp were almost entirely limited to the under 10 fathom depth. The catch of pink shrimp did not exceed one pound at any station during the cruise.

M/V "Gus III" Cruise GUS-12 (December 10-22, 1963): Bad weather hampered operations of the chartered research vessel Gus III during this cruise off the Alabama coast extending westward off the coast of Texas. A total of ten statistical areas (10, 11, 13, 14, 16, 17, 18, 19, 20, and 21) were covered and one 3-hour tow with a 45-foot shrimp trawl was made in the three depth ranges of each area. Despite adverse weather conditions all stations were fished. Catches were generally spotty but good white shrimp catches

of up to 40 pounds were made in the 0-10 fathom depth of areas 13, 14, and 16. The largest haul of 40 pounds of white shrimp (26-30 count) from that depth range was from area 13 which also yielded 32 pounds of 21-25 count brown shrimp from over 20 fathoms.

Area 16 yielded 38 pounds of 15-20 count brown shrimp from the 10-20 fathom depth and there were relatively good catches of the same size shrimp in over 20 fathoms of areas 14 and 20.

Area 11 off the Mississippi coast yielded 33 pounds of large shrimp ranging from 15 to 25 count from the over 20-fathom depth divided about equally between the brown and white species. Catches from the other two depths in that area were negligible.

A catch of about 20 pounds from up to 10 fathoms in area 10 off the coast of Alabama was largely 21-25 count white shrimp. Each tow in the other two depth ranges of that area yielded less than one pound of brown and pink shrimp.

This was the last cruise of this series by the *Gus III*. A slightly different pattern will be fished in 1964.

Notes: (1) Shrimp catches are heads-on weight; shrimp sizes are the number of heads-off shrimp per pound.

(2) See *Commercial Fisheries Review*, January 1964 p. 13.



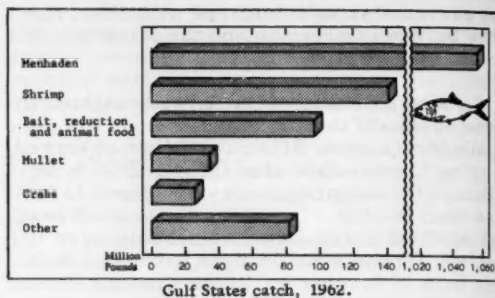
Gulf States

FISHERIES LANDINGS, 1962:

Fish and shellfish landings during 1962 in the Gulf States (west coast of Florida, Alabama, Mississippi, Louisiana, and Texas) reached an alltime high of over 1.4 billion pounds valued at a record \$94.5 million ex-vessel. This was an increase of 60.3 million pounds (4 percent) and \$19 million (25 percent) as compared with 1961.

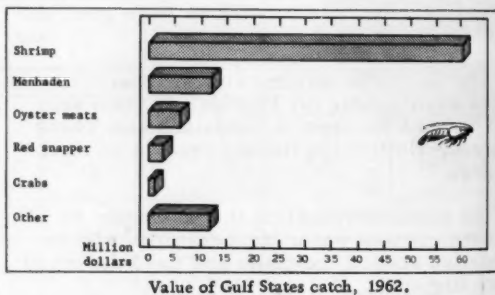
The gain in quantity over 1961 was due principally to record menhaden landings of 1.1 billion pounds (up 36 million); improved shrimp production totaling 142 million pounds (up nearly 8 million); and a 97-million-pound catch of unclassified fish for use as bait, reduction, and animal food (up 18.5 million). There was also some improvement in landings of Spanish mackerel, groupers, oysters, and mullet. However, compared with 1961,

there were notable reductions in landings of blue crabs, catfish and bullheads, black drum, and red snapper.



The value increase resulted chiefly from larger catches of high-priced shrimp. There were also moderate gains in the value of menhaden and oysters.

Three States (Louisiana, Mississippi, and Texas) accounted for 1.3 billion pounds or 91 percent of the total quantity; while Texas, Louisiana, and the west coast of Florida accounted for \$84 million or 89 percent of the value.



There were 23,212 fishermen engaged in the Gulf fishery in 1962. Commercial fishing craft operating in those States during the year consisted of 3,219 vessels of 5 net tons and over, 9,639 motor boats, and 638 other boats.



Hawaii

SKIPJACK TUNA LANDINGS, JANUARY-NOVEMBER 1963:

Skipjack tuna landings in Hawaii in November 1963 were about 280,00 pounds, 35,000

pounds below the 1948-62 average for the month. The cumulative total catch for January-November 1963 was 8,045,000 pounds, or 1,592,000 pounds below the 1948-62 average for the same period.

During November there were 71 productive trips, giving an average of 2,665 pounds per productive trip. Individual catches ranged from 121 pounds to 9,827 pounds.

* * * * *

COMMERCIAL FISHERY LANDINGS, JULY-JUNE 1962/63 AND 1961/62:

The commercial fish landings of the State of Hawaii during the 1962/63 fiscal year (July-June) totaled 10,879,389 pounds, valued at \$2,566,045 ex-vessel. Compared with the 1961/62 fiscal year, the State landings decreased 3,051,782 pounds or 21.9 percent, and the ex-vessel value decreased \$307,229 or 10.7 percent. The drop in weight and value of the 1962/63 landings was due primarily to the skipjack (*Katsuwonus pelamis*) landings which declined 3,262,717 pounds or 31.6 percent in weight and \$326,118 or 25.9 percent in value.

Table 1 - Hawaiian Commercial Fishery Landings and Ex-Vessel Value,
July-June 1962/63 and 1961/62

Species	Hawaiian Name	July-June 1962/63		July-June 1961/62	
		Quantity 1,000 Lbs.	Value \$1,000	Quantity 1,000 Lbs.	Value \$1,000
English Name	Hawaiian Name				
Common Catches:					
Amberjack	Kahala	87	38	89	31
Big-Eyed Scad	Akule & Mahimahi	173	123	244	185
Cavalries	Uluu, Onilu	77	34	76	33
Dolphin	Mahimahi	139	51	109	47
Goniistius	Weka-ula, Weka Moelua, Moorea Kumu, Maui	115	62	111	50
Mackerel scad	Opelu	437	139	221	80
Maui:					
Grey	Uku	66	27	56	22
Pink	Opakapaka, Kalekale	127	63	123	20
Red	Ulaia Kona, or Onaga Ulaia or Ika	113	75	68	80
North, South, & Maui:					
Marlin		488	139	579	151
Island & Neothunnus:					
Albacore	Ahi	18	4	16	5
Big-Eyed	Ahi	1,175	573	1,182	579
Yellowfin	Ahi	440	156	385	143
Skipjack	Aku	7,057	935	10,319	1,261
Bonito or little tuna ..	Kawakawa	34	6	3	1
Other:					
Crabs	Kona & misc. species	24	14	34	23
Lingcod	Opili	19	10	7	4
Lobster, spiny	Ulu	8	5	10	7
Octopus	Heo	5	3	3	2
Shrimp	Muhua	12	3	9	5
Grand Total:		10,879	2,566	15,991	2,875

Other important species that showed decreased landings in 1962/63 were the Pacific blue marlin (*Makaira amplia*), 69,537 pounds or 27.1 percent; and the big-eyed scad (*Trachurus crumenophthalmus*), down by 71,543 pounds or 29.3 percent.

Landings of two species in 1962/63 that increased substantially were the yellowfin tuna (*Neothunnus macropterus*) and the mackerel scad (*Decapterus pinnulatus*). The in-

crease for the yellowfin tuna amounted to 64,497 pounds or 16.8 percent and that for mackerel scad amounted to 215,715 pounds or 97.5 percent.

Table 2 - Hawaiian Commercial Fishery Landings by Islands,
July 1962-June 1963

Island	Sea Catch		Pond Catch		Total Catch	
	Quantity 1,000 Lbs.	Value \$1,000	Quantity 1,000 Lbs.	Value \$1,000	Quantity 1,000 Lbs.	Value \$1,000
Hawaii	1,466	354	-	-	1,466	354
Maui	1,101	159	-	-	1,101	159
Lanai	20	7	-	-	20	7
Molokai	8	6	8	4	16	11
Oahu	8,022	1,916	35	27	8,057	1,944
Kauai	219	91	-	-	219	91
Total	10,836	2,534	43	32	10,879	2,566

The Island of Oahu in the fiscal year ending June 30, 1963, accounted for 8,059,000 million pounds (valued at \$2,566,000) or about 74.1 percent of the quantity and 75.8 percent of the value. The Island of Hawaii was the second most important in landings and value and accounted for about 13.5 percent of the total landings and 13.8 percent of the value.

Table 3 - Hawaiian Commercial Fishery Landings by Months,
July 1962-June 1963

Month	Sea Catch		Pond Catch		Total Catch	
	Quantity 1,000 Lbs.	Value \$1,000	Quantity 1,000 Lbs.	Value \$1,000	Quantity 1,000 Lbs.	Value \$1,000
1962						
July	2,072	314	5	4	2,078	318
August	1,200	229	5	4	1,205	233
September	852	192	5	3	857	195
October	894	214	3	3	897	216
November	521	184	4	3	525	187
December	810	264	5	5	815	269
1963						
January	446	125	5	4	451	129
February	645	183	2	1	648	185
March	563	175	2	1	565	176
April	484	175	2	1	486	176
May	891	212	1	1	892	213
June	1,459	268	2	1	1,461	269
Total	10,837	2,535	43	31	10,880	2,566

Note: Due to rounding, totals in Table 2 and 3 do not agree in some cases.

The only other Island of the six reporting commercial fishery landings of more than 1 million pounds was Maui.

Landings in July made up about 19.1 percent of the 1962/63 fiscal year's landings and, as in past years, the peak season for the skipjack fishery (June-September) accounted for about 51.5 percent of total landings. (Department of Land and Natural Resources, Honolulu, November 20, 1963.)

Note: See *Commercial Fisheries Review*, January 1963 p. 33.



Industrial Fishery Products

TRENDS IN USE OF FISH MEAL IN MAINE AND MASSACHUSETTS:

Animal feed manufacturers and experiment station scientists in Maine and Massachusetts, fish reduction plants in Maine, and a feed mill in New Hampshire were visited in December 1963, by the Chief of the U. S. Bureau of Commercial Fisheries Technical Advisory Unit and the Animal Nutritionist attached to the Unit. Observations made during the trip were as follows:

The State of Maine is among the 10 leading states in the production of broilers and therefore is a relatively large consumer of fish meal. On the other hand, swine, which like poultry, consume fish meal, are reared in relatively small numbers, and there appears to be an opportunity in that State for an increase in pork production. Only half the eggs consumed in Massachusetts are produced in that State; this offers poultrymen an opportunity for expansion. These possible increases in poultry and swine production obviously would work to the advantage of fish meal producers by increasing the total consumption of fish meal.

The average levels of fish meal utilization in northeastern broiler, layer replacement, and laying rations appear to be about the same as those in the Southeastern States, namely, 2.5 percent in rations for broilers and chicks reared as layer replacements and 0.5 percent in laying rations. This is true despite the fact that fish meal is produced in the area. However, the level of utilization may be influenced by the fact that it has been necessary to import fish meal from abroad in order to supply the demand, and, as is true in the southeast, the necessity of using imported meal tends to depress the level of utilization.

Almost without exception, the animal nutritionists expressed high regard for fish meal. In the opinion of one nutritionist employed by a large concern, there is, without doubt, no other product available having as much potential as a balanced source of amino acids as has fish meal; this appears to be the opinion of most poultry nutritionists. Some of the feed manufacturers stated that they would prefer bulk shipments to sacked shipments of fish meal.

Most animal nutritionists and laboratory directors expressed lively interest in any advances that can be made in determinations of protein quality of fish meal. One concern is carrying out active research to determine to what extent enzymatic digestibility tests can be relied upon in comparison with the much more time-consuming chick or rat tests. Another feed mill depends upon chemical tests to tell whether or not there is a great deal of variation between different shipments of meal from a given source.

A poultry nutritionist at the University of Maine has recently completed some experiments in which fish meal significantly stimulated growth of layer flock replacement chicks during the first 9 weeks following hatching. Also, a Maine professor said that a number of egg producers in his State are building their own feed mills. Operators of these mills, in an effort to decrease the variety of feed ingredients that must be stored, have been exploring the possibility of eliminating fish meal and some other feed ingredients from their formulas. The Maine professor, who had been consulted concerning the proposed formula simplification, indicated that the elimination of fish meal from poultry feed formulas would be highly inadvisable, in his opinion, because it would mean the lowering of the quality of the rations.

At the University of Massachusetts, some very basic experiments on the endocrinology of fowl are being carried out. Such studies usually lead to a better understanding of physiology and, eventually, to increased economy and profits.

UPWARD TREND IN USE OF FISH MEAL IN SOUTHERN STATES:

Mixed animal feed manufacturers and experiment station scientists in Alabama, Georgia, Mississippi, and Louisiana were visited during mid-November 1963 by the Chief of the U. S. Bureau of Commercial Fisheries Technical Advisory Unit and the animal nutritionist attached to the Unit. Fish reduction plants in Mississippi and Louisiana also were visited. The observations and conclusions resulting from the trip were as follows:

Interacting factors are discernible, in the area visited, that tend on the one hand to encourage and on the other to discourage liberal use of fish meal in poultry rations. A factor encouraging more liberal utilization has been the feed-ingredient price structure. During November 1963, relative prices of feed ingredients encouraged a trend toward relatively liberal utilization of fish meal. This trend was exemplified by commercial broiler rations that contained 6, 8, and even 10 percent fish meal. In general, such rations are formulated on a "maximum profit" basis, i.e., the cost per pound of feed is disregarded and the feed is formulated to produce a maximum of broiler meat per dollar invested in feed.

A number of factors tend to depress the level of fish meal utilization. One such factor is the result of competition between firms to produce rations of given quality to be sold at competitive prices. In order to reduce costs, formulators may substitute less expensive protein concentrates for part of the fish meal of a ration. Such concentrates are likely to be inferior to fish meal because of lower coefficients of digestibility, less desirable balance of essential amino acids, and lower content of the essential amino acids methionine and lysine. In addition, most protein concentrates other than fish meal lack the unidentified growth factor (UGF) of fish. Thus, as most formulators freely acknowledge, a reduction in the level of fish meal to lower the sale price of the feed mixture usually results in a somewhat less desirable ration.

A second factor tending to discourage liberal use of fish meal is the present unavailability of domestic meal. Of the feed mixers visited, most either had exhausted their supplies of domestic fish meal or were rapidly depleting their remaining stores. Many feed producers expressed a definite reluctance to use imported meal in liberal amounts. This reluctance is based upon what feed mill operators appear to believe is the extreme variability in the quality of imported meal. For example, according to one feed mill operator, in amounts no larger than a carload lot, sacks of meal have been found that appear to have originated in six different reduction plants, and variations in quality within such carload lots are, as one would expect, considerable.

According to an industrial nutritionist, a third factor historical in nature has tended to depress fish meal utilization in broiler rations in the Southern States. The nutritionist said that when the broiler-producing industry first got its start, rations ordinarily consisted of such suitable grain products as were readily available, plus a protein-mineral-vitamin mixture purchased from one of the firms specializing in such "premixes." The latter ordinarily contain fish meal in amounts too small to represent a liberal supply of fish meal in the finished ration. Fish meal utilization subsequently has tended to follow the levels established earlier by feed producers using premixes.

As a result of the interplay of factors, just described, the average fish meal content of broiler rations produced in the Southern States appears to be about 2.5 percent. This estimate is based upon information given both by experiment station specialists and by industrial nutritionists. Even though the average utilization level is relatively low percentage-wise, very large amounts of fish meal are utilized in the Southern broiler-producing States because of the tremendous poultry production in that region.

The evidence collected on this trip, and earlier, suggests that the demand for fish meal will continue to increase in the

Southern broiler-producing States but that the rate of increase cannot be expected to be rapid.

Several industrial nutritionists expressed some concern with present methods of quality control of fish meal, pointing out, as have many others in the past, that biological (chick and rat) tests are too protracted to yield the desired data before the feed mixtures containing the protein being tested have been sold and perhaps consumed. The need for a rapid test for quality is apparent. One nutritionist pointed out that microscopic examination of fish meal by a skilled technician reveals a great deal concerning the quality of the meal, as for example, whether or not even slight scorching has taken place.

Broiler production is still on the increase in the Southern broiler-producing States, but such increase is taking place at a decelerating rate. In contrast with this decline in rate of increase in broiler production, a marked increase in egg production is now taking place. Some new egg production units are of 1-million hen size and a few are even larger. This increase in egg production will add to the demand for fish meal for the reason that laying flocks usually contain some fish meal and rations for layer replacement flocks ordinarily contain relatively liberal amounts of such meal.

The production of dogfood and other petfoods seems to be increasing in the states visited. A large portion of the output of some large concerns now consists of petfoods. Because fish meal is used in low concentrations in some of these petfoods, this expanding branch of the mixed feed industry can be expected to have a limited but positive influence on the demand for fish meal. (U. S. Bureau of Commercial Fisheries, Technical Advisory Unit, Boston, Mass., December 16, 1963.)

U. S. FISH MEAL, OIL, AND SOLUBLES:

Production by Areas, November 1963: Preliminary data on U. S. production of fish meal, oil, and solubles for November 1963 as collected by the U. S. Bureau of Commercial Fisheries and submitted to the International Association of Fish Meal Manufacturers are shown in the table.

Area	Meal Short Tons	Oil 1,000 Pounds	Solubles .. (Short Tons) ..	Homogenized ³
November 1963:				
East 6 Gulf Coasts .	9,537	9,283	3,520	-
West Coast ² . . .	2,447	1,026	1,084	-
Total	11,984	10,309	4,604	-
Jan.-Nov. 1963				
Total	221,654	178,273	88,514	7,216
Jan.-Nov. 1962				
Total	295,730	255,129	111,532	10,964

¹Does not include crab meal, shrimp meal, and liver oils.
²Includes American Samoa and Puerto Rico.
³Includes condensed fish.

Note: Beginning with March 1963 fish oil is shown in pounds instead of gallons. Conversion factor, 7.75 pounds equal 1 gallon.

Major Indicators for U. S. Supply, November 1963: United States production of fish

meal and fish oil in November 1963 was higher by 17.8 and 24.9 percent, respectively, as compared with November 1962. Fish solubles production was down 4.5 percent.

Item and Period	1963	1962	1961	1960	1959
..... (Short Tons)					
Fish Meal:					
Production 1/:					
December	-	2,683	12,763	9,178	15,378
November	2/ 11,984	10,175	10,071	10,805	11,840
Jan.-Oct.	2/ 209,670	285,555	268,503	250,360	255,026
Jan.-Dec.	-	311,232	311,265	290,137	306,551
Imports:					
December	-	18,977	23,268	15,564	5,538
November	-	11,904	25,649	6,149	3,673
Jan.-Oct.	335,259	221,426	168,565	109,848	124,464
Jan.-Dec.	-	232,307	217,845	131,561	133,955
Fish Solubles 3/:					
Production:					
December	-	1,838	4,936	2,897	5,429
November	2/ 4,604	4,819	5,140	3,524	4,628
Jan.-Oct.	2/ 91,126	117,677	102,165	92,508	155,302
Jan.-Dec.	-	124,334	112,241	98,929	165,359
Imports:					
December	-	387	472	60	420
November	-	435	3,649	282	3,089
Jan.-Oct.	3,442	5,486	2,618	2,832	23,121
Jan.-Dec.	-	6,308	6,739	3,174	26,630
..... (1,000 Lbs.)					
Fish Oils:					
Production:					
December	-	679	11,562	7,981	14,094
November	2/ 10,309	8,254	10,599	12,464	9,416
Jan.-Oct.	2/ 167,964	246,875	244,507	195,209	169,801
Jan.-Dec.	-	255,808	266,668	215,653	193,324
Exports:					
December	-	172	10,484	15,807	19,586
November	-	171	1,425	14,640	6,096
Jan.-Oct.	228,934	122,707	110,575	113,229	118,801
Jan.-Dec.	-	123,550	122,486	143,659	144,481

¹Does not include crab meal, shrimp, and misc. meals.

²Preliminary data for 1963 based on reports which accounted for the following percentage of production in 1962: Fish meal, 54 percent; solubles and homogenized fish, 97 percent; and fish oil, 75 percent.

³Includes homogenized fish.

⁴Beginning with March 1963 fish oil is shown in pounds instead of gallons. Conversion factor, 7.75 pounds equal 1 gallon.

Note: Data for 1963 are preliminary.

Production, October 1963: During October 1963, 15,608 tons of fish meal and 14.2 million pounds of oil were produced in the United States. Compared with October 1962, this was a decrease of 20,357 tons or 57 percent in meal production, and 24.8 million pounds or 64 percent in oil production.

Menhaden meal production for October amounted to 11,420 tons--a decrease of 20,708 tons or 64 percent. Menhaden oil (12.3 million pounds) was 25.7 million pounds or 68 percent less than in October 1962.

Fish solubles manufactured in October 1963 amounted to 6,678 tons. This was a decrease of 6,636 tons (approximately 50 percent) below the production of the same month in 1962. Menhaden solubles (4,494 tons) made up 67 percent of the October fish solubles production.

Fish meal production amounted to 209,670 tons during the first 10 months of 1963. This was a decrease of 75,885 tons or 27 percent. Oil production for the same period of 1963

amounted to 168.0 million pounds--a decrease of 78.9 million pounds. Production of fish solubles for the first 10 months of 1963 amounted to 83,902 tons--a decrease of 23,355 tons or 22 percent.

U. S. Production of Fish Meal, Oil, and Solubles, October 1963 ¹ with Comparisons				
Product	October		Jan.-Oct.	
	1/1963	1962	1/1963	1962
(Short Tons)				
Fish Meal and Scrap:				
Herring	324	487	7,283	5,035
Menhaden	11,420	33,128	165,168	231,100
Sardines, Pacific	13	18	29	689
Tuna and mackerel	2,225	2,074	18,283	22,669
Unclassified	1,128	1,280	18,907	26,062
Total	15,606	35,963	209,670	265,555
Shellfish, marine-animal meal and scrap	3/	3/	3/	3/
Grand total meal and scrap	3/	3/	3/	3/
Fish Solubles:				
Menhaden	4,404	10,738	68,432	82,196
Other	2,164	3,576	15,480	25,059
Total	6,568	15,314	83,902	107,257
Homogenized condensed fish	-	850	7,224	10,420
Total				
(1,000 Pounds)				
Oil, Meal:				
Herring	346	295	5,261	5,034
Menhaden	12,368	37,931	150,498	230,134
Sardines, Pacific	4	2	6	186
Tuna and mackerel	1,153	516	4,830	4,387
Other (including whale)	398	246	7,349	7,164
Total oil	14,171	38,990	167,964	246,875

¹ Preliminary data.

² Includes a small quantity of thermal heating.

³ Not available on a monthly basis.

U. S. FISH MEAL AND SOLUBLES:

Production and Imports, January-October 1963: Based on domestic production and imports, the United States available supply of fish meal for January-October 1963 amounted

U. S. Supply of Fish Meal and Solubles, January-October 1963 with Comparisons			
Item	Jan.-Oct.		Total 1962
	1/1963	1962	
..... (Short Tons)			
Fish Meal and Scrap:			
Domestic production:			
Menhaden	165,168	231,100	238,680
Tuna and mackerel	18,283	22,669	26,559
Herring	7,283	5,035	5,095
Other	18,936	26,751	40,898
Total production	209,670	285,555	311,232
Imports:			
Canada	43,735	37,488	42,806
Peru	256,433	164,573	186,249
Chile	23,197	8,255	9,247
So. Africa Republic	8,275	9,884	10,084
Other countries	3,619	1,226	3,921
Total imports	335,259	221,426	252,307
Available fish meal supply	544,929	506,981	563,539
Fish Solubles:			
Domestic production ² /	91,126	117,677	124,334
Imports:			
Canada	1,753	1,236	1,335
Iceland	55	2,205	2,332
So. Africa Republic	191	1,442	1,717
Other countries	1,443	603	924
Total imports	3,442	5,486	6,308
Available fish solubles supply ..	94,568	123,163	130,642

¹/Preliminary.
²/50-percent solids. Includes production of homogenized condensed fish.

¹ Preliminary.

² 50-percent solids. Includes production of homogenized condensed fish.

to 544,929 short tons--37,948 tons (or 7.5 percent) more than during the same period in 1962. Domestic production was 75,885 tons (or 26.6 percent) less, but imports were 113,833 tons (or 51.4 percent) higher than in the same period in 1962. Peru continued to lead other countries with shipments of 256,433 tons.

The United States supply of fish solubles (including homogenized fish) during January-October 1963 amounted to 94,568 tons--a decrease of 23.2 percent as compared with the same period in 1962. Domestic production and imports dropped 22.6 percent and 37.3 percent, respectively.

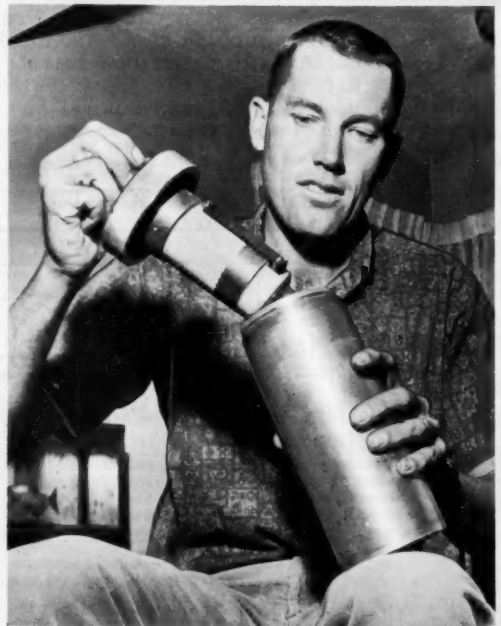


Inventions

"BATHYKYMOGRAPH" MEASURES SPEED AND DEPTH OF NET WHILE FISHING:

A device known as a bathykymograph has been designed to measure how deep and how fast a net sinks while fishing. The information may help fishermen in placing their nets.

The bathykymograph is cylindrical, 12 inches long and 4 inches in diameter. The cylinder is equipped with a sealed piston and stylus. The device is attached to the net. As the capsule sinks, water pressure on the pis-



Frank J. Hester, the inventor, holds bathykymograph which can tell how fast and deep a fish net sinks.

ton compresses a spring which moves the stylus and a clock-like device, recording depth and time.

The bathykymograph has been patented by Frank J. Hester, 2033 Abbott Street, San Diego, Calif.

MULTI-IMMERSION QUICK FREEZER:

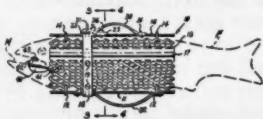
The inventor claims this is a quick-freezing process designed for enterprises having limited complementary facilities other than freezer storage. It is said to decrease the cost of operation by maintaining higher refrigeration efficiency and low energy load by freezing in stages with very simple devices. (Patent No. 3,078,687, SIC No. 3585, granted Willis R. Woolrich, 700 Texas Avenue, Austin 5, Texas.)

METHOD OF ATTACHING FISHING SINKERS:

The inventor claims this is a simple method of handling split-shot type weights and attaching them to a fishing line. It involves joining the weights together in a chain effect with a plastic ribbon, gummed paper tape, or integrally cast connectors. It is said that attachment of one or more of the weights is then simplified by their symmetric arrangement on the connector. (Patent No. 3,084,469, SIC No. 3949, granted Thomas H. Stratton, Box 454, State Farmers Market, Columbia, South Carolina.)

FISH HOLDER PATENTED:

A new device has been designed for grasping the body of live fish while removing hooks. The risk of hand injury from fins, scales, or spines is thereby avoided, according to the inventor. The device is adjustable in size and can be made of various corrosive-resistant materials. (Patent Number 3,081,576, granted Harry C. Collins, 11 West Third Street, Ocala, Florida.)



Irradiation Preservation

PRELIMINARY TESTS ON OILY FISH INDICATE FLAVOR AND STORAGE PROBLEMS:

Research on the irradiation of fish and fish products in the Seattle Laboratory of the U. S. Bureau of Commercial Fisheries have consisted primarily of the investigation of non-oily species such as sole and crab. During the Atomic Energy Commission contract year (July 1963-June 1964), a series of species of oily fish (either containing a high oil content or oil with a high degree of instability) are to be irradiated and their storage-keeping quality tested. Such fish as the various species of salmon, herring, sablefish, and some of the rockfishes will be included. The first species (pink salmon) tested has presented some very serious problems. Not only does rancidity limit the storage life of the irradiated samples to a shorter period than that of the unirradiated controls, but also the initial desirable, normal salmon flavor is largely destroyed by the irradiation process. It is obvious that considerable basic research will be necessary if satisfactory results are to be realized using irradiation as a tool for increased storage life of fish with high oil content.



Maryland

OYSTER STUDIES IN 1963 INDICATE FAVORABLE CONDITIONS FOR SPAWNING AND SETTING:

The late 1963 oyster spat in Maryland's tidewaters was generally light and ended by mid-September at all stations where test shells were exposed. This was earlier than usual, as evidenced by a number of years when fair sets were recorded as late as mid-October. Factors that contributed to the early end of setting were the lower than normal water temperatures that occurred during late summer and early fall and the completely spawned out condition of most oysters that had produced such excellent midsummer sets. At most stations water temperatures dropped below 70° F. shortly after mid-September, about three weeks earlier than normal.

A survey of the commercial or surviving set on all State plantings was conducted in late 1963 by the Tidewater Fisheries Depart-

ment survey vessel Tiny Lou with a biologist cooperating full time in making the observations. Excellent spat counts on bars in many areas confirmed the good sets whose potential had previously been indicated by the test shell bags.

In general, 1963 has produced one of the best oyster sets on record with high counts of spat particularly in the Eastern Chesapeake Bay area, lower Choptank tributaries, Little Choptank River, and St. Marys' River. An exceptionally heavy set was found in the upper Wicomico tributary of the Potomac River, the third such set recorded in the past 24 years with little or no set during intervening years.

The conditions needed to bring about a good oyster set result from a complicated combination of factors that are not all fully understood. However, certain features of 1963 that favored a good set in Maryland were: Weather during March was much warmer than normal and accompanied by copious rainfall. This started oysters feeding vigorously with an abundance of food early in the season. May was cooler than normal so that feeding conditions were excellent while the beginning of oyster spawning was delayed. The result was that oysters generally were exceptionally fat and in top condition by the beginning of June before spawning commenced.

Late spring and summer 1963 were marked by drought conditions and an absence of storms or strong winds. Salinity of the bay was much higher than normal and the lack of fresh water run-off retarded the formation of low oxygen conditions in deep water that are caused in part when a layer of fresher water floats near the surface. The spawning of oysters is known to be favored by the higher salinities, and two periods of sharp temperature rises occurred during the summer that would tend to trigger mass spawning. The above conditions favored production of an abundance of oyster larvae wherever brood stock was present.

Newly hatched oysters while in the 2-week swimming stage are microscopic and, though able to swim slowly up or down, are entirely at the mercy of water currents in their long distance movement. Since only a small percentage of the bottom is shell covered and suitable for setting it is not unusual for a large part or even all of a good brood of larvae to be swept away from the oyster beds and into deep channels or over unfavorable bottom where they will smother and be lost at

the time when setting must occur. Thus good broods of larvae often are observed in the water that become totally lost in storms before they can set. The relatively calm waters of last summer permitted a greater portion than usual of the oyster larvae to be retained in the creeks and bays where there were shell beds upon which they could set.

The flow of heavier salt water from the ocean along the Bay's bottom and the spinning of the earth tend to carry oyster larvae near the bottom upstream and swing them towards their right as they move up the channel. Thus concentrations of larvae can occur in the upper part of small tributaries or embayments where there is no strong downstream flow of fresh water. They also concentrate along the right hand bank, as you look upstream, of the Bay proper and of large tributaries such as the Potomac and James Rivers. This is one of the reasons why setting usually is higher along the eastern side of the Bay than along its western side.

A sustained flow of wind from one direction may produce currents that carry larvae into a given area and at the same time carry them away from another location so that ideal setting conditions do not occur in all places at the same time. That is one of the reasons why, even in a particularly good setting year, some areas failed to receive good sets.

Still another factor that can sharply reduce an oyster set is the presence or absence of oyster enemies such as the oyster drill or "screw borer." Oyster drills must have quite salty water and so are seldom a serious problem in Maryland except on the seaside and in the lower portions of Somerset County waters. There have now been several years that were drier than normal and this has permitted a strong build-up of the drill population in Tangier Sound and even up into the lower part of Fishing Bay, Hooper Straits and the lower Honga River. Each young drill can eat several young oyster spat per day so that many newly set spat never get big enough to be easily seen by the naked eye. The abundance of drills in 1963 in the Tangier Sound area was quite destructive and was a major factor in the sharp reduction in the surviving oyster set.



Oysters grew quite well during 1963 and there were no reports of serious oyster mortalities since the late 1963 winter. A survey showed that the fungus *Dermocystidium*, while favored by high salinity, was apparently checked by cooler water temperatures and though present in the lower part of the Maryland area, and in some instances found further upstream than usual, produced no serious problem where it had been monitored.

The parasite "MSX" has remained as a light infestation on certain bars in the Pocomoke and Tangier Sound areas. It is possible that the higher salinities may result in some increase of infection by this parasite with the extent of future damage somewhat dependent upon salinity conditions in 1964. The reports of much lower losses in 1963 from "MSX" in Delaware Bay and in the lower Chesapeake continue to be a most hopeful sign.

The condition of oyster meats was better in the fall of 1963 than in the fall of 1962. Oysters were generally fat on most bars except for a few localities. Water temperatures had fallen rapidly during the 1963 fall period to curtail fattening. Late fall 1963, temperatures were too low for effective feeding so that oyster condition is expected to decline slowly during the winter period of hibernation and not improve until warming in the spring of 1964.

A few reports of oysters that were poor and shucking out only a few pints were received. These were checked as of early December 1963 and no parasite had been found associated with the condition. One apparent cause of poor yields in pints per bushel was the rapid growth in 1963 that enabled many young oysters to reach legal size but with thin shells, long bills, and shallow cups. Especially when clustered, these thin flat oysters cannot yield many pints even when fairly fat. (Chesapeake Biological Laboratory, Solomons, Md., December 10, 1963.)



Michigan

STOCKS OF LAKE TROUT INCREASE DUE TO RESEARCH:

Latest studies give United States and Canadian conservation agencies another solid vote of confidence behind their joint efforts to control the parasitic sea lamprey and re-

build lake trout populations in the upper Great Lakes.

Good survival and growth among lake trout in Lake Superior continue as the result of lamprey control and fish plantings in recent years, according to reports made during the December 1963 meeting of the Great Lakes Fishery Commission in Ottawa, Canada. Also, catches of adult sea lamprey remained relatively low in 26 streams along the south shore of Lake Superior where electrical barriers are in operation.

Although up somewhat from 1962, the 1963 lamprey take is still 79 percent below the average catch of these eel-like predators during the 1957-61 period.

Barrier operations and commercial catches underline the combined effectiveness of lamprey control and fish plantings in Lake Michigan. Through September 1963, commercial operators had taken 26,000 pounds of lake trout in those waters, their highest total since 1949. A year earlier they had netted only 325 pounds from Lake Michigan.

Lamprey catches in 1963 declined 55 percent from 1962 in 2 of 3 Lake Michigan streams where barriers are in use. The reduction was recorded in the Bark and Sturgeon Rivers which were chemically treated. In the untreated Cedar river, there was a 12-percent jump in the number of lampreys captured.

Lake trout studies show a drop in the number of lamprey-scarred fish caught in Lake Superior. Too, they reveal a continued improvement in the average size of lake trout which has increased from 2.5 to 3.4 pounds during the last five years.

The U. S. Bureau of Commercial Fisheries reported that lake trout 29-32 inches long were more abundant in 1963; those in the 25-28-inch group made smaller gains. Fewer fish were available from 1962 to grow into the 21-24 inch category. Lake trout less than 21 inches long were more numerous in 1963, virtually all of them being hatchery fish.

As expected, hatchery-reared fish again accounted for a larger percent of lake trout catches in Michigan's Lake Superior waters. East of the Keweenaw Peninsula, hatchery fish made up almost 55 percent of the legal catch through September 1963 as compared

to only 1.2 percent in 1959. Among the undersized fish, the hatchery figure climbed from less than 3 percent in 1959 to 94 percent in the fall of 1963.

In Wisconsin waters there also had been a marked increase in the abundance of juvenile lake trout in Lake Superior, due almost entirely to large plantings of hatchery fish.

Fisheries officials are particularly encouraged by signs of lake trout spawning in most areas along the Michigan shore of Lake Superior from Grand Marais westward. Last fall's spawning run was the largest since 1958 in Wisconsin's waters, and there is good reason to expect that 1964 will see another large increase of spawning fish in these and other parts of Lake Superior.

The lake trout restoration program is coordinated by the Great Lakes Fishery Commission. Federal, Canadian, and state agencies, including the Michigan Department of Conservation, are cooperating in the long-range effort. (Michigan Department of Conservation, Official News Bulletin, December 12, 1963.)



New England Fisheries

BOTTOMFISH AND SCALLOP LANDINGS IN 1963 AND FORECAST FOR 1964:

Changes in the abundance of groundfish on New England fishing banks are expected to be mixed during 1964, and the abundance of sea scallops will decline, according to the Acting Director of the North and Middle Atlantic Region of the U. S. Bureau of Commercial Fisheries. This forecast is based on information provided by biologists of the Bureau's Woods Hole Laboratory who monitor the landings of commercial fishermen, and study the population of fish and shellfish on offshore fishing banks by sampling with the Bureau's new fishing research vessel Albatross IV.

Haddock landings in New England in 1963 will be about 112 million pounds, a decline from the 117 million pounds landed during 1962. The stocks of haddock on New England banks are expected to remain in only fair supply during 1964, so landings in 1964 will not improve. The drop will be most noticeable in the scrod category because of the scarcity of small fish which has been due to the age groups spawned in 1960, 1961, and 1962 being below average in abundance.

However, things will be brighter in the haddock fishery after 1964. The survival of fish spawned in 1963 appears to have been unusually high. Both the summer and fall surveys of the offshore banks by the Albatross IV indicate the greatest abundance of young fish since the surveys were started in 1953. These young fish will reach marketable size and thus begin to be important to the fishery in the summer of 1965. This 1963 age group is expected to support the fishery for several years.

Landings of cod in 1963 will be slightly less than the 35 million pounds landed in 1962. There has been an upward

trend in cod landings during the past few years, and abundance in 1964 is expected to remain at a relatively high level. Surveys by the Albatross IV show a fairly strong age group spawned in 1963 which should enter the fishery in late 1964 and early 1965.

Landings of ocean perch in 1963 will be somewhat over 100 million pounds with abundance holding steady. There is some indication that there will be more fishing in the Gulf of St. Lawrence in 1964. If so, total United States landings in 1964 will exceed those of 1963.

Yellowtail flounder landings in 1963 will be nearly 75 million pounds, an all time high. This is due to increased abundance of fish which resulted from excellent survival of the age groups spawned in 1958, 1959, and 1960. The oldest of these age groups will be of less importance in 1964, and the following age group (1961) appears to be a poor one. Therefore, abundance and landings are expected to be lower in 1964, although still at a relatively high level.

United States landings of whiting (silver hake) in 1963 will total about 92 million pounds which is slightly less than the figure for 1962. The U.S.S.R. fleet probably removed an equal quantity of whiting from the area during the year. What effect the Russian fishing will have on the stocks of whiting cannot be determined at this time, according to Bureau biologists. Thus they are withholding any estimate of the availability of this species to United States fishermen during the year 1964. There is, however, no indication at present of any serious decline in abundance.

Sea scallops have suffered a decline in abundance during 1962 and 1963 although total landings by United States and Canadian fishermen did not slip much in 1963. United States vessels landed about 19.7 million pounds of scallop meats in 1963, which was 16 percent less than the 23.5 million pounds landed in 1962. Canadian landings, however, increased from 13.9 million pounds in 1962 to 16.4 million pounds in 1963. Research vessel surveys show that the downward trend in abundance is continuing and landings are expected to decrease again in 1964.



North Atlantic Fishery Investigations

GROUNDFISH DISTRIBUTION AND ABUNDANCE STUDIES:

M/V "Albatross IV" Cruise 63-7-2 (December 2-16, 1963): To determine the fall distribution and relative abundance of groundfish species from Georges Bank to Hudson Canyon and to study marine food and its availability to a number of groundfish species were the main objectives of this cruise by the U. S. Bureau of Commercial Fisheries research vessel Albatross IV.

Around-the-clock fishing operations were conducted with a No. 36 trawl (lined). A total of 86 fishing and 2 hydrographic-plankton stations were occupied, 128 bathythermograph casts were made, and 300 sea-bed drifters were released. Otoliths were removed from 31 cod, scales were taken from 473 haddock and 1,190 yellowtail flounder, and 1,760 stomachs from many species were examined. Hy-

drographic and plankton data were collected. Temperature data were collected on a specific transect to compare with the temperature readings taken from an airplane with infrared equipment.

There were on the cruise two biologists from the Marine Fisheries Laboratory of the New Jersey Division of Fish and Game. Fluke and porgy are extremely important to New Jersey commercial and sport fishermen, and the present cruise provided an opportunity for cooperative work on the winter distribution of those two species.

Note: See Commercial Fisheries Review, Sept. 1963 p. 37.



North Atlantic Fisheries Exploration and Gear Research

TUNA DISTRIBUTION STUDIES IN NORTH ATLANTIC CONTINUED:

M/V "Delaware" Cruise 63-11 (November 13-25 and December 2-10, 1963): This exploratory long-line cruise continued seasonal coverage of the tuna populations in waters east of New England and south of Nova Scotia by the U.S. Bureau of Commercial Fisheries exploratory fishing vessel Delaware. The objectives of the cruise were to: (1) investigate the distribution, abundance, and migration of tuna and swordfish; (2) evaluate the tuna and swordfish commercial fishing potential in the Northwest Atlantic; and (3) collect descriptive oceanographic data.

Previous pelagic long-line explorations in the Northwest Atlantic during November and December had been limited to the work of the Japanese exploratory fishing vessel Shoyo Maru in December 1959, and that of the Woods Hole Oceanographic Institution research vessel Crawford in November 1960.

New information was obtained by the Delaware during cruise 63-11. The known range of albacore (*Thunnus alalunga*), yellowfin (*Thunnus albacares*), big-eyed (*Thunnus obesus*), and skipjack (*Katsuwonus pelamis*) in the late fall season was extended north to 41° latitude and east to 60° longitude by a significant catch at station No. 4 (see table). The catch of 12 albacore on 420 hooks at Station No. 8 (2.9 fish per 100 hooks) proved to be the highest known catch rate for this species in the Northwest Atlantic. The conspicu-

ously small catch of bluefin tuna (*Thunnus thynnus*) suggested that this species had not moved into the oceanic (Gulf Stream front) area from continental slope waters.

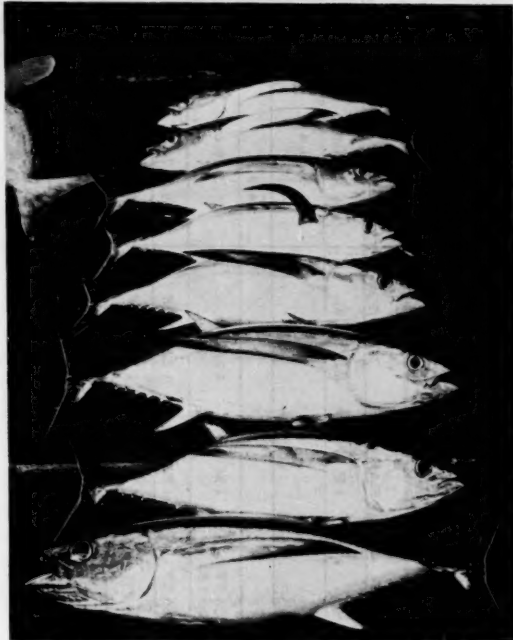


Fig. 1 - Albacore tuna from a Delaware long-line set off New England on November 23, 1963.

Of the 12 long-line sets (3,570 hooks) completed during the cruise, 8 were daylight sets and 4 were night sets. Gear consisted of Japanese-type long-line (160 fathoms of mainline with 7 branchline assemblies per "basket"). Several "baskets" were modified to test new long-line gear components: polypropylene mainline and branchline, vinyl-covered galvanized wire leaders, and aluminum leader crimping ferrules. Floatline lengths were varied at 10, 20, and 30 fathoms to determine relationships of catch to depth and temperature. A minimum of four bathythermograph casts were made at each long-line station. Squid, herring, and mackerel were used to determine bait selectivity.

Seven temperature transects between stations provided thermal environmental data to assist in positioning long-line sets. The long-line set at Station No. 4 was of particular interest because of its position across a "thermal wall;" on the warm side, the catch pro-

Station Data and Catches for M/V Delaware Cruise 63-11											
Sta. No.	Date 1963	Time	Position		Gear & Set No.	No. of Hooks	Tuna	Sharks	Misc. Fish	Surf Temp. ° F.	Remarks 1
			Lat.	Long							
1.	11-15	0730-1445	42-02N	64-06W	LL#1	420		1 P	2 LL, 2 SL	52.7-53.0	
2.	11-17 11-18	2150- -0815	42-00N	62-45W	LL#2 DNNL	210				52.3-53.4	
3.	11-20	0000-0200	41-28N	60-12W	DNNL					54.5	
4.	11-20	0635-1410	41-14N	59-56W	LL#3	420	5 A, 2 YF 1 BE, 1 SJ	1 M	4 LL	55.4-69.6	1A - Lost
5.	11-21	0625-1355	40-39N	62-16W	LL#4	420	1 A, 4 YF	1 B	1 LL, 1 LS	69.3-71.9	3 YF - Tagged
6.	11-21 11-22	2150- -1050	41-00N	62-48W	LL#5 DNNL	210	6 BE	3 M	1 LL, 1 LF 2 SW	59.7-60.9	5 BE - Tagged
7.	11-22	0645-1315	41-06N	62-45W	LL#6	210	1 YF, 2 BE	1 M	1 LL	50.4-59.9	1 YF - Tagged 2 BE - Tagged
8.	11-23	0625-1415	40-22N	64-00W	LL#7	420	12 A, 6 YF 4 BE, 2 BF	1M	3 LL 1 Opah	50.6-54.5	4 A - Tagged 4 YF - Tagged 2 BE - Tagged 2 BF - Tagged
9.	12-5	0620-1420	40-15N	64-12W	LL#8	420	6 A, 5 BE	1 M	1 LL	51.5-64.1	1 A - Tagged 3 BE - Tagged 1 A - Lost 1 M - Tagged
10.	12-5 12-6	2140- -1050	40-13N	65-45W	LL#9	210	1 A		1 SW, 1 C 1 LF	53.9-63.0	1 A - Tagged
11.	12-6	0700-1305	40-12N	65-44W	LL#10	210			2 SL 1 Opah	53.9-61.8	
12.	12-7 12-8	2135- -1025	39-06N	66-26W	LL#11 DNNL	210	1 BE	1 B, 1 M		62.5-63.0	
13.	12-8	0635-1235	39-07N	66-30W	LL#12	210			1 SL, 1 R	62.9-63.0	
	Totals					3,570	25 A, 13 YF, 19 BE, 2 BF, 1 SJ	1 B, 8 M 1 P	13 LL, 1 R 5 SL, 2 Opah 3 SW, 2 LF 1 C, 1 LS		6 A - Tagged 8 YF - Tagged 12 BE - Tagged 2 BF - Tagged 1 M - Tagged 2 A - Lost
1/Fish tagged and released are included in the catch; fish lost at the rail are not included in the catch. Abbreviations: Gear: LL = Long line; DNNL = Dip net, Night light, Tuna: A = Albacore; BE = Big-eyed; BF = Bluefin; YF = Yellowfin; SJ = Skipjack. Sharks: B = Blue; M = Mako, P = Porbeagle. Misc. Fishes - LL = Long-nose lancetfish; SL = Short-nose lancetfish; SW = Swordfish; R = Pelagic ray; C = Centrolophus sp.; LF = Lepidocybium flavobrunneum; LS = Longbill spearfish.											

1/Fish tagged and released are included in the catch; fish lost at the rail are not included in the catch.

Abbreviations: Tuna: LL = Long line; DNNL = Dip net, Night light, YF = Yellowfin; SJ = Skipjack.

Sharks: A = Albacore; BE = Big-eyed; BF = Bluefin; YF = Yellowfin; SJ = Skipjack.

Misc. Fishes: B = Blue; M-Mako, P = Porbeagle.

SL = Short-nose lancetfish; SW = Swordfish; R = Pelagic ray; C = Centrolophus sp.; LF = Lepidocybium flavobrunneum; LS = Longbill spearfish.

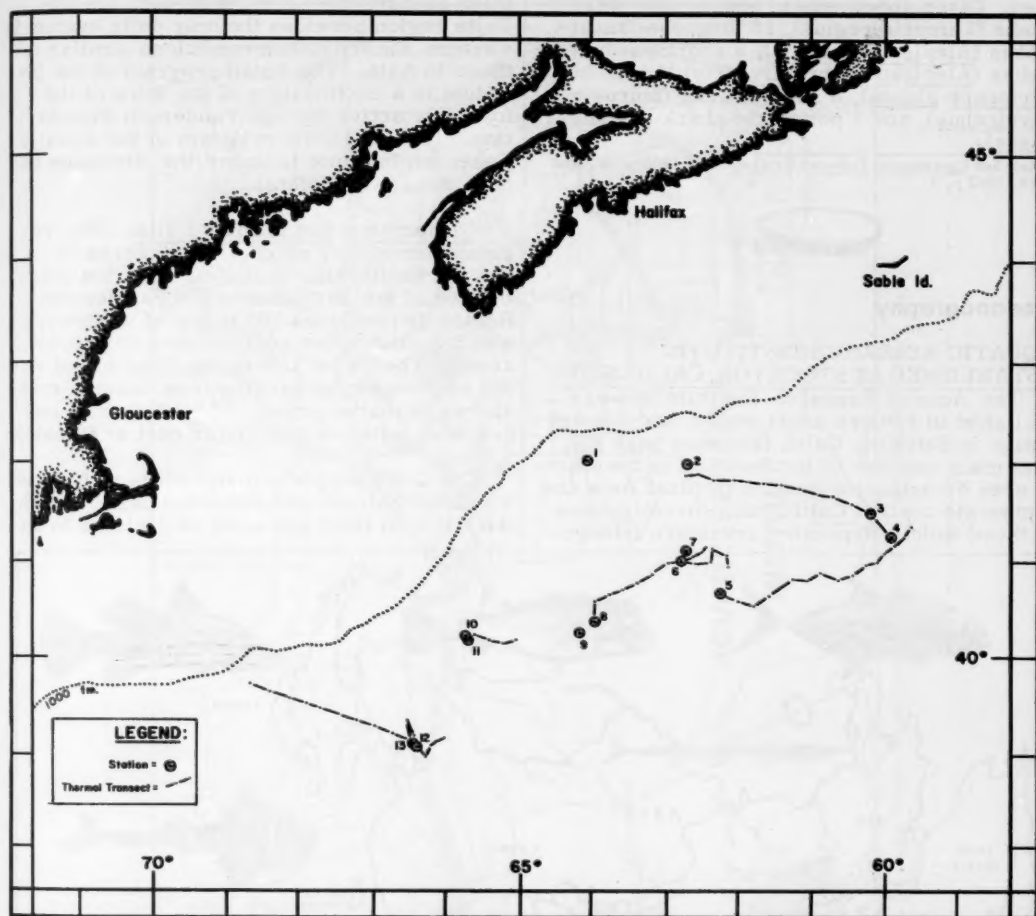


Fig. 2 - Area of operations during M/V Delaware Cruise 63-11, November 13-25, and December 2-10, 1963.

gressed from skipjack to albacore and yellowfin at the "wall," and ended with a single big-eyed tuna on the colder side of the "wall."

During the bait selectivity tests at station nos. 4, 5, 7, and 8, herring and squid baits were used on alternate "baskets." The albacore catch on herring was eight times that on the squid bait, and all yellowfin taken at those stations were caught on herring. Mackerel and squid were fished during night sets; the catch was too small to indicate a bait preference although two small swordfish (*Xiphias gladius*) (41 and 75 pounds) were caught on mackerel, while a 300-pound swordfish was taken with herring bait.

The average weight of the tuna in the catch were: albacore 31 pounds, big-eyed 60 pounds, yellowfin 52 pounds, bluefin 65 pounds, and skipjack 21 pounds. The only tuna that sustained shark damage was a 125-pound big-eyed. Fish that were not needed for additional study were tagged and released.

Aside from the tuna and swordfish catch, several other specimens of scientific interest were taken during the cruise, including the longbill spearfish (*Tetraturus pfluegeri*), 1 specimen; the gempylid (*Lepidocybium flavo-brunneum*), 2 specimens; the black ruff (*Centrolophus niger*), 1 specimen; and the pelagic stingray (*Dasyatis violacea*); 1 speci-

men. Other specimens of lesser note were 2 opahs (*Lampris regius*), 13 longnose lancetfishes (*Alepisaurus ferox*), 5 shortnose lancetfishes (*Alepisaurus brevirostris*), 1 blue shark (*Prionace glauca*), 8 mako sharks (*Isurus oxyrinchus*), and 1 porbeagle shark (*Lamna nasus*).

Note: See *Commercial Fisheries Review*, Aug. 1963 p. 36, and Feb. 1962 p. 1.



Oceanography

AQUATIC RESEARCH INSTITUTE ESTABLISHED AT STOCKTON, CALIFORNIA:

The Aquatic Research Institute was established in 1962 as a non-profit, tax-exempt entity in Stockton, Calif. (see map page 41). The main concern of the Institute is the coastal area or estuarine zone of tropical Asia and temperate central California. Investigations in those widely separated areas are interre-

lated because the Sacramento-San Joaquin Delta region provides the only delta system in western America with conditions similar to those in Asia. The Asian program of the Institute is a continuation of the work of the formerly active George Vanderbilt Foundation. The scientific program of the Aquatic Research Institute is under the direction of Dr. Robert R. Rofen.

Sacramento-San Joaquin Delta: This region extends over about 738,000 acres in central California. It is located at the confluence of the Sacramento and San Joaquin Rivers and includes 700 miles of waterways which have a water surface covering 50,000 acres. The Delta embraces a variety of water environments, ranging from marine rocky shores to marsh areas. Tidal influence and brackish water extend as far east as Stockton.

The Delta supports many kinds of fish and wildlife. Salmon and steelhead pass through the Delta on their spawning migrations to up-

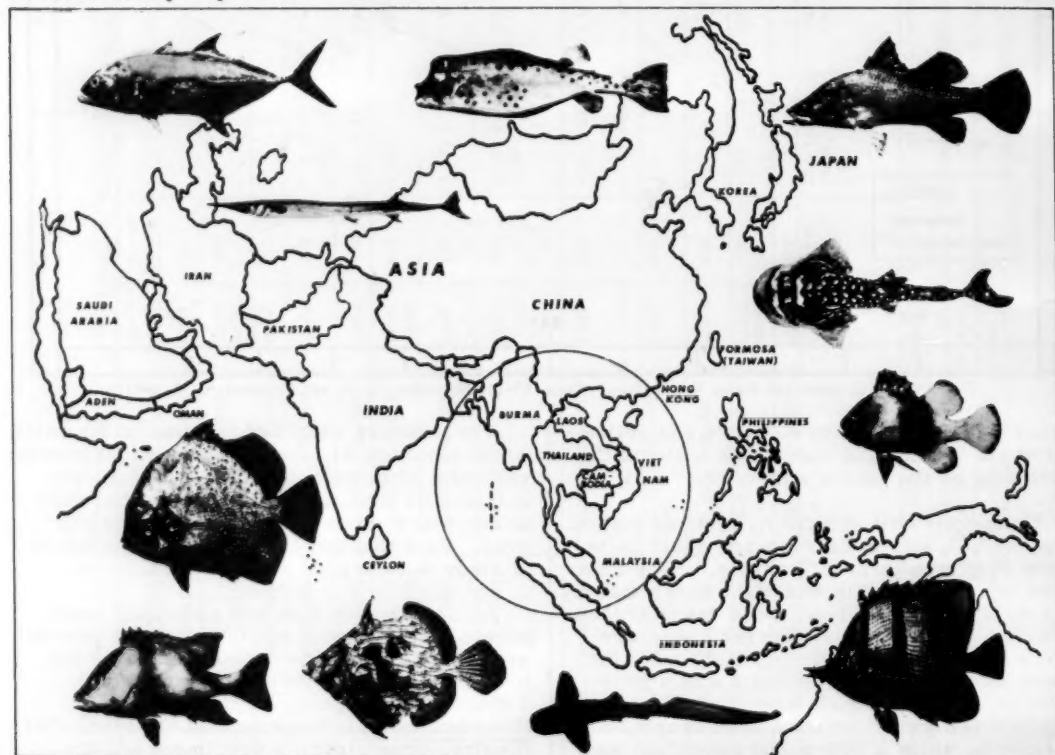


Fig. 1 - Shows the Asiatic region (where one-half of the world's people live) with its seas and estuaries, good sources of food if fishery resources can be properly developed.

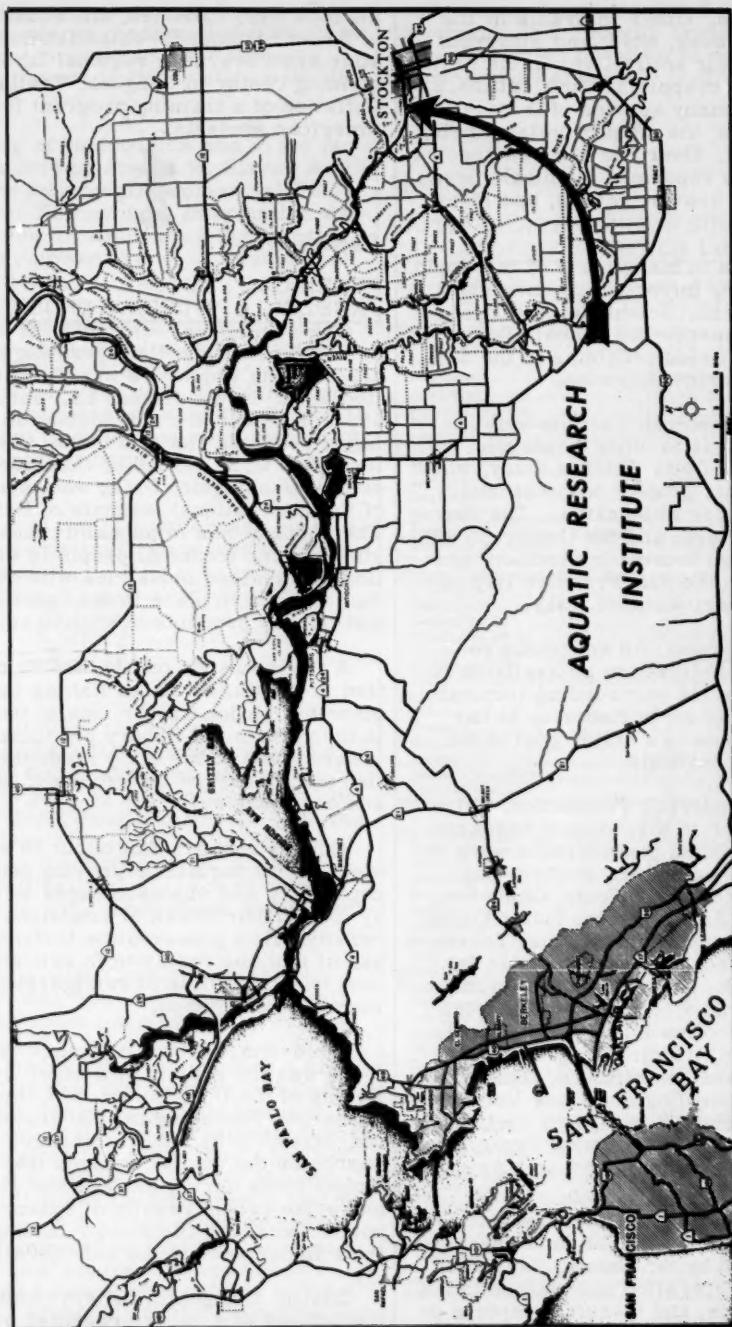


Fig. 2 - Shows the Sacramento and San Joaquin Delta area in central California.

stream tributaries. Other migrants in the Delta are striped bass, shad, and sturgeon. Fish which live their entire lives in the Delta area include bass, crappie, sunfish, catfish, and carp. There are many species of invertebrates in the Delta, the most prominent being shrimp and clams. Over two hundred species of birds have been reported. Mammals present include mink, beaver, racoon, and river otter.

Tidal estuaries in many parts of the world today are providing important commercial quantities of protein. Scientific investigations in the Sacramento-San Joaquin Delta can aid in solving basic problems in the development of estuarine fisheries.

The Aquatic Research Institute will be aided by its nearness to other research groups such as the Delta Wildlife Study, which is a California State project with headquarters and laboratories in Stockton. The San Joaquin Delta College, and the University of the Pacific are also located in Stockton, and the universities in the San Francisco Bay region are only a short distance away.

The Asian Program: An enormous resource of food is believed to be available in the seas and estuaries surrounding tropical Asia. The development of fisheries to harvest those resources is a major goal of the Aquatic Research Institute.

The George Vanderbilt Foundation, which was the forerunner to the Aquatic Research Institute, accomplished considerable work in Asia between 1950 and 1961. Fishery surveys were conducted in the South China Sea, Gulf of Thailand, Andaman Sea, Indian Ocean, French Oceania, Line Islands, Trust Territory of the Pacific Islands, and the Hawaiian Islands. A handbook of the food fishes of the Gulf of Thailand and a book on the fisheries of the Western Caroline Islands were completed. In addition, training programs were carried out for fisheries officers, aquatic biologists, and ichthyologists of the United States, Thailand, Hong Kong, South Viet Nam, Philippines, South Korea, Taiwan, Japan, and other countries of southeast and east Asia.

The plans of the Aquatic Research Institute call for: (1) completion of Asian research programs initiated by the George Vanderbilt Foundation; (2) preparation and publication of handbooks, manuals, and technical reports on

the food fish, fisheries, and aquatic ecology of Asian regions; (3) establishment and operation of an overseas regional laboratory and training center in Bangkok, Thailand; and (4) initiation of a training program for Asian and American students.



Refrigeration

TECHNICAL SYMPOSIUM ON FREEZING OF FISHERY PRODUCTS:

The semiannual convention of the American Society of Heating, Refrigerating and Air-conditioning Engineers was held at the Hotel Roosevelt, New Orleans, La., January 27-29, 1964. It featured a symposium on the freezing of seafoods chaired by Charles Butler of the U. S. Bureau of Commercial Fisheries, Washington, D. C., who is a member of the International Institute of Refrigeration. The purpose was to acquaint managers, engineers, and technical people in the refrigeration and seafood industries with developments that have taken place in the freezing of fish and fishery products over the past 40 years.

A review paper on the history of refrigeration in the United States fishing industry was given by Harden Taylor, one of the pioneers in the freezing of fishery products. It reviewed some of the early methods of freezing fish and discussed the growth of the frozen seafood industry.

Quality changes that occur in shrimp and methods for further improving product acceptability and wholesomeness were discussed by Dr. Arthur Novak of Louisiana State University. New preservation techniques on the use of ionizing radiation in extending the natural fresh qualities of refrigerated shrimp were also described.

Time-temperature tolerance of frozen foods was the subject of a paper by John Peters of the U. S. Bureau of Commercial Fisheries Technological Laboratory, Gloucester, Mass. It included a discussion of research on the quality changes that occur in frozen foods during storage and distribution; and some recent results of research being conducted at the Gloucester laboratory and their importance to the refrigeration industry.

Quality changes in fishery products was the subject of a paper presented by Dr. William

Dyer of the Fisheries Research Board of Canada. The biochemical changes that take place in fish prior to, during, and after freezing, and their significance to fish quality were discussed.

The freezing of seafood now and in the future was discussed by Joseph W. Slavin, Acting Chief of the Bureau of Commercial Fisheries Branch of Technology. Information was given on methods for estimating the freezing rates of fishery products and on commercial freezing techniques.

A paper on the role of the refrigeration engineer in the seafood industry by Luke St. Onge of V. C. Patterson and Associates concluded the session. The daily problems of refrigeration engineers in designing fish storage and freezing installations were discussed; some specific applications were dealt with in detail.

Registration at the convention was open to the public and registrants were invited to attend the symposium.



Sardines

MAINE PACK, 1963:

A total of 1,584,000 standard cases (100 3½-oz. cans) of Maine sardines was canned during the 1963 packing season, according to the Maine Sardine Council. Although this was considerably less than the 2,117,000 cases produced during the 1962 season, it was well ahead of the critically small pack of only 671,000 cases in 1961, when there was a shortage of fish.

The Maine Sardine Council's Executive Secretary said that fish were abundant in all areas along the coast for most of the season in 1963 and that this gave canners a wide selection which enabled them to produce a high quality pack. He said that a policy of balanced production from season to season by most canners had resulted in an increasingly favorable inventory situation which should further improve with the usual high Lenten demand. "Markets and distribution temporarily lost to imports because of the 1961 shortage have been mostly recovered so that the Maine sardine industry now enjoys well over 50 percent of the total sales of all sardines in the United States," according to the Council's rep-

resentative. He also pointed out that volume movements in a recently launched export market development program have further helped to bring inventories into favorable balance.



Shrimp

UNITED STATES SHRIMP SUPPLY INDICATORS, DECEMBER 1963:

Item and Period	1963	1962	1961	1960
... (1,000 Lbs., Heads-Off) ...				
Total landings, So. Atl. and Gulf States:				
February	3,986	4,123	3,910	3,784
January	3,993	3,833	5,686	5,402
December	10,300	8,615	6,538	7,099
November	13,212	12,177	9,996	14,454
January-October	115,448	85,047	74,861	119,481
January-December	138,960	105,839	91,396	141,035
Quantity canned, Gulf States 1/:				
February	281	241	90	204
January	592	492	183	266
December	2,180	1,879	816	894
November	2,400	2,727	2,175	1,535
January-October	24,752	18,604	11,508	23,965
January-December	29,332	23,210	14,500	26,394
Frozen inventories (as of end of each mo.) 2/:				
February 28	28,039	19,012	37,612	28,063
January 31	28,487	21,328	37,842	34,332
December 31	3/	31,577	19,755	40,913
November 30 4/	42,142	27,500	20,668	37,264
October 31 4/	37,418	21,315	17,811	31,209
September 30	27,356	12,843	13,361	24,492
Imports 5/:				
February	12,100	10,599	8,932	7,657
January	13,139	12,907	12,338	8,596
December	3/	15,798	15,442	12,411
November	14,759	17,964	14,852	13,516
January-October	120,474	107,421	95,888	87,482
January-December	3/	141,183	126,268	113,418
(c/lb., 26-30 Count, Heads-Off)				
Ex-vessel price, all species, So. Atl. and Gulf Ports:				
February	85.7	78.9	53.5	51.8
January	85.0	76.3	52.5	49.5
December	6/54-65	82.9	75.2	54.2
November	6/52-62	84.5	73.5	54.0
October	6/51-64	90.0	68.7	53.0
September	6/55-64	90.9	70.1	52.2
August	59.0	83.6	66.1	52.0
July	63.5	82.1	55.8	54.6
Wholesale price frog. brown (5-lb. pkg.) Chicago, Ill.:				
February	102-106	93-95	69-71	65-67
January	102-106	91-94	69-71	64-66
December	75-82	101-107	91-92	68-70
November	71-78	105-110	80-82	69-73
October	67-75	108-115	83-90	69-73
September	73-77	113-118	87-90	65-70
August	75-81	110-112	76-91	64-67
July	77-97	3/	70-75	72-77

1/Pounds of headless shrimp determined by multiplying the number of standard cases by 30.3.

The figures in the section (Quantity canned, Gulf States) have been completely revised beginning with February 1963 on the basis of a new conversion factor (formerly 33.0 pounds per case).

2/Not available.

3/Inventory of September 30, 1963, includes 2,868,000 pounds; and November 30, 1963, includes 1,183,000 pounds for firms not reporting previously.

4/Includes fresh, frozen, canned, dried, and other shrimp products as reported by the Bureau of the Census.

5/Range in prices at Tampa, Fla.; Morgan City, La.; area; Port Isabel and Brownsville, Texas, only.

Note: December 1963 landings and quantity used for canning estimated from information published daily by the New Orleans Fishery Market News Service. To convert shrimp to heads-on weight multiply by 1.68.

POSTLARVAL STUDIES INDICATE POSSIBLE VALUE AS INDEX OF ADULT POPULATION:

The first year of the postlarval shrimp study being made by the Mississippi Gulf Coast Research Laboratory under a U. S. Bureau of Commercial Fisheries contract was completed in October 1963. Although identification of all specimens to species has not been completed, it seems likely that a satisfactory index for prediction of the adult population of commercial species of shrimp is being established. Retention of all samples has produced a large quantitative collection of many species living along the shores of Mississippi Sound and adjacent bays. Records of hydrographic data are extensive.

The contract with the Bureau has been renewed and data for another year will be collected and compared to what has already been completed.



Smoked Fish

STATUS REPORT ON SMOKED FISH-PROCESSING STUDIES CONDUCTED IN GREAT LAKES REGION:

The progress made on smoked fish processing studies to test the effects of certain process time/temperatures for the production of smoked chub is outlined in a report issued on January 10, 1964, by the Regional Director, U. S. Bureau of Commercial Fisheries, Ann Arbor, Mich. The studies were conducted at the Bureau's Great Lakes Technological Laboratory in Ann Arbor.

One of the first objectives of these smoked fish-processing studies was to evaluate product quality as affected by interim processing guidelines provided by the U. S. Food and Drug Administration (FDA) and States concerned with the subject. Initial tests were completed by early January, and procedures that were used, results obtained, and their significance to the fishing industry follow:

General Procedures:

1. **Raw Material:** Fifty-pound blocks of dressed "medium" chub frozen at 0° F. in alginate were used.

2. **Thawing of Blocks:** The 50-pound blocks were removed from frozen storage and thawed by immersing in a tank of cold

tap water for periods of time ranging from 8-12 hours.

3. **Brining:** The brining operation was conducted in a large plastic tank. Granulated salt was poured into the empty tank in an amount estimated to make a sufficient quantity of brine. Cold tap water was then added to the tank by use of a hose. Hose pressure was used to stir the mixture to facilitate solution. Salometer readings were made at frequent intervals to achieve desired brine strength.

4. **Smoking:** After brining, the fish were individually hung head-down on "smoke-sticks." The weight of fish on each stick was then obtained to the nearest 0.1 pound for "brined weight." These sticks have a series of pairs of sharp-pointed nails protruding on two sides. The fish are hung on the sticks by skewering them at the tail-end on the nails. Each stick held about 5 pounds of fish, and 2 sticks were used to evaluate each of the subsequent treatments.

Traditional wood-fired ovens were used for tests 1 and 2. For subsequent tests, a small gas-fired smokehouse was used in order to achieve controlled conditions of temperature (no control of relative humidity).

During each test, thermocouples were inserted into several representative fish and others were left exposed in several locations within the smokehouse. Continuous recordings were made of internal temperature of product and smokehouse temperature by use of a gas-fired 24-point recording potentiometer.

For all tests using the gas-fired oven, the smokehouse remained cold until the fish were loaded therein. After loading, heat was applied to the oven, at which time the smoke generator was turned on and smoking was continued throughout the process.

After processing, the fish were removed from the smokehouse and placed in a 0° F. freezer for a minimum of one hour to cool. After cooling, the fish were weighed to the nearest 0.1 pound to obtain "smoked weight."

5. **Holding Conditions:** Upon completion of weighing, the fish were packaged either in bulk or vacuum packs, and either frozen at 0° F. or stored at 36° F.

Yield: Percentage yield was obtained by the following formula:

$$\frac{\text{smoked wt.}}{\text{brined wt.}} \times 100 = \% \text{ yield}$$

Results:

1. Raw Fish: Analyses of frozen, raw control samples were as follows:

% water	- 75.9
% fat	- 7.0
% salt	- 0.1

2. Smoked Fish: Analyses of smoked samples heated to various internal temperatures were as follows:

Test No.	Brine Strength	Maximum	Percentage of			
		Internal Temp.	Water	Fat	Salt	Yield
1	25° - 12 hrs.	165°	68.7	9.6	4.0	70
2	25° - 12 hrs.	180°	63.4	9.3	4.5	57
3	25° - 15 hrs.	180°	69.0	8.2	4.9	72
4	25° - 15 hrs.	180° for 30 min.	67.3	7.2	6.0	67
5	25° - 15 hrs.	160° for 5 hrs.	57.8	9.5	7.6	54

Note: Unless otherwise indicated, product was removed from oven when maximum internal temperature was attained. Otherwise, maximum internal temperature was maintained for time period indicated.

Tests 1-2 conducted in wood-fired smokehouse.

Tests 3-5 conducted in gas-fired smokehouse.

Tests 3-4 total process time of 2½ hours.

Test 5 total process time of 6½ hours.

3. Pasteurization after Smoking: Samples of smoked fish were vacuum-packaged in plastic pouches and placed in water heated to 190° F. It required 40 minutes for the internal temperature of the product to reach 180° F.; this temperature was then maintained for an additional 30 minutes.

The plastic pouch used for water-bath pasteurization was a lamination of cellulose and polyethylene. Although the pouch remained intact during the treatment, it acquired a "frosted" appearance. However, more suitable materials would be readily available commercially.

It was noted that little or no moisture or oil was rendered from the smoked fish into the pouch as a result of pasteurization such that the product's appearance would be objectionable. The meat of the pasteurized fish remained firm and moist.

Discussion:

The primary purpose of the tests was to determine the effect on product quality of

processing smoked chub to an internal temperature of 180° F. for 30 minutes. The attribute of quality was considered, for this purpose, to be the general eating qualities of flavor, texture, and degree of moistness of the edible portion, plus the general appearance of the product as contrasted with that of chub smoked in the traditional manner. Also considered were such economic factors as percentage of yield of smoked product and time required to process.

The results of the tests indicated that chub can be processed in a controlled smokehouse to an internal temperature of 180° F., maintained at this temperature for 30 minutes, and produce an acceptable product in terms of eating quality. Comparison of this product to chub smoked to lower internal temperatures (i.e., 165° F.) in wood-fired ovens permits the following general observations:

1. Over-all appearance of the new product seemed reasonably acceptable. Some wrinkling of the skin was noted, but was not judged to be excessive. Color was poor (light), but could probably be corrected with a more suitable smoke generator.

2. Yield of products smoked conventionally in a wood-fired smokehouse equalled 70 percent. Yield of products processed to 180° F. for 30 minutes in a gas-fired smokehouse equalled 67 percent (total process time = 2½ hrs.).

3. Incidence of fish dropping from the smoke sticks during heating was extremely low (of 300 pounds processed, a total of 3 fish fell to the bottom of the oven).

4. Taste test indicated the meat to be somewhat less moist than the conventional product, but not objectionably so.

5. Texture of meat was somewhat firmer than the conventional product.

6. Preliminary comparisons of frozen versus refrigerated samples clearly indicated significant "softening" of the texture as a result of freezing.

Smoked Fish Manual: One action the Bureau of Commercial Fisheries planned was the preparation of a manual that would describe good commercial sanitary processing and handling techniques and the significance

of Cl. botulinum type E to the industry. Such a smoked fish-processing and handling manual, providing interim guidelines for process and sanitation control, is being prepared and is expected to be available to industry in draft stage at least, in a relatively short time. Included in the manual will be sections on botulinum food intoxication, process and sanitation control recommendations, and a sanitation checklist for processors.

Research on Cl. Botulinum Type E: Type E botulism has been traced to smoked fishery products manufactured in Great Lakes States. Review of the botulinum outbreaks and other information on the distribution and properties of the organism clearly indicates that Cl. botulinum type E represents a serious potential hazard in smoked fishery products. Recognizing the seriousness of this matter, regulatory agencies have taken emergency interim measures considered adequate to safeguard the consumers. Aside from the impact of these events on the consumer, these emergency regulations have dealt the smoked fish industry a crushing blow, particularly in the Great Lakes region.

Recognizing the need for prompt attention to certain problem areas requiring specialized knowledge and research on Cl. botulinum type E, the Bureau of Commercial Fisheries has initiated contract research studies, the results of which will allow for the more orderly development of the required processing and handling codes for the smoked fish industry. A contract has been effected with the University of Wisconsin. Professor E. M. Foster, Bacteriology Department, will be conducting studies for the development of thermal death time curves for Cl. botulinum type E toxin and spores on smoked fishery products, as affected by certain product variables. A research contract has also been negotiated with Michigan State University. Professor R. Lechowich, Department of Food Science, will be concerned with methodology for recovery of low levels of type E toxin and spores from smoked fish as well as with heat resistance of the spores and temperature requirements for toxin formation in smoked fish.

When results of the processing work and the contract work, described before, have been obtained, it will then be possible to go to FDA and the various cooperating states with a definite proposal to modify the interim processing regulations now in effect with the intent to substitute regulations based on

scientific evidence that the industry can live with.

Progress in Marketing and Consumer Education: Consumer confidence in all fishery products marketed in the Great Lakes has been badly shaken, and in some instances destroyed, as a result of the publicity stemming from the botulism incidents and the FDA warning to the public about the use of smoked fish from Great Lakes processing plants. The publicity was erroneously interpreted by the public to include fresh and frozen fishery products despite efforts on the part of industry to clarify FDA action.

As a result, sales of fish in retail outlets dropped off 30 to 50 percent, and even more in some localities. Restaurants have reported sales of fish dinners off 25 to 60 percent. Fish have been taken off some school lunchroom menus. Inventories of fish used for smoking in the Great Lakes area persist at high levels and most Great Lakes fishermen have been informed to stop fishing.

United States consumer fear of Great Lakes fishery products has international implications as well. The Canadian Consulate at Detroit, Mich., reported that sales of Canadian fresh-water fish to United States customers have drastically declined--whitefish as much as 80 percent.

Great Lakes fishery associations have requested Bureau of Commercial Fisheries assistance in developing and implementing an intensive market promotion program in the Midwest. In response to that request, the Bureau's marketing program in the Midwest has been reoriented, and the marketing staff was active for six weeks in a stepped-up consumer education effort calculated to restore consumer faith in fishery products.

Emergency consumer education activities by the Bureau of Commercial Fisheries to help restore confidence in fishery products included: 7 live TV fish-cookery demonstrations, 6 taped TV demonstrations, 4 radio interviews, 4 TV interviews, and 1 presentation for an Executive Chef Association. These were presented in five states. In addition, three 10-minute video tapes of fish-cookery methods were made at a Chicago educational television station at the Bureau's expense. Copies of the tapes will be used by the Bureau's marketing specialists in scheduling programs throughout the Midwest and other areas.

Bureau of Commercial Fisheries personnel from the Ann Arbor Regional Office have held meetings with fishery association groups in Michigan, Illinois, Wisconsin, Minnesota, and Ohio, to explain the botulism problem, to discuss the effects of the adverse publicity on the fishing industry, and to plan avenues of corrective action. It is generally agreed that an all-out industry-Government promotional effort is needed to restore the good image of fishery products to Midwest consumers and, almost as important, to help restore the confidence of the fishing industry in itself and in its products. It has been agreed further that such a promotion was to begin immediately, with a gradual buildup occurring during the Lenten period, peaking in the spring, and continuing at a high level throughout the coming year. It is generally recognized that this will not be an easy task and that intensive cooperative industry-Government efforts will be necessary if normalcy is again to be restored to the markets for fishery products in the Midwest.

Some promotional activities have been undertaken by the fishing industry. The Fisheries Council of the Great Lakes was formed in Detroit. This group sponsored a fish buffet served in the Michigan Capitol Rotunda to almost a thousand persons. The Wisconsin Fisheries Council planned promotional activities to begin the first week in February. Similar plans have been stimulated for a Minnesota promotion through industry members in Duluth. Chicago industry members were also studying promotional action. Prospects look favorable that these groups and others can be drawn together for concerted action.

Major Great Lakes industry associations were organizing a concerted market promotion effort in the Midwest. At the request of industry, an industry-Government marketing assistance proposal was prepared for consideration. Invitations were sent to the associations and to major industry members to send representatives to a meeting held January 11, 1964, in the Bureau's Ann Arbor Regional Office to discuss the initiation of an action program. It was further hoped that this meeting will be the vehicle for organizing a Great Lakes-wide action group to speak and act for the entire industry, in all of its phases.

Note: See Commercial Fisheries Review, December 1963 p. 85.



South Atlantic Exploratory Fishery Program

SCALLOP DISTRIBUTION SURVEY OFF FLORIDA:

M/V "Silver Bay" Cruise 51 (November 6-19, 1963): To assess the seasonal distribution and availability of calico scallops (*Pecten gibbus*) off the east coast of Florida between St. Augustine and Stuart was the primary objective of this 14-day cruise by the U. S. Bureau of Commercial Fisheries exploratory fishing vessel Silver Bay.

A total of 177 dredging stations were occupied with 6- and 8-foot tumbler dredges fitted with 2-inch bag rings and 2-inch mesh nylon liners. The best catches were made in a strip roughly 10 miles long and 2 miles wide, centered at latitude 28° 30' N., at a depth of 26 to 27 fathoms. There the average catch rate was 12 bushels of shell stock per 30-minute drag. The largest individual scallop catch was 12 bushels in 15 minutes. The scallops in that area averaged 50 to 55 millimeters (1.97-2.17 inches). Their shucked yield averaged 107 meats per pint (see map on page 48).

In all areas surveyed, dead shell dominated the catches. In depths of 12 to 32 fathoms, catches of small scallops--25 to 45 millimeters (0.98-1.77 inches) in diameter--were common.

Seven shrimp-trawling stations were occupied with a 50-foot flat trawl with 6-foot chain doors. Only small catches of white shrimp (*Penaeus setiferus*) resulted.

Note: See Commercial Fisheries Review, January 1964 p. 29.

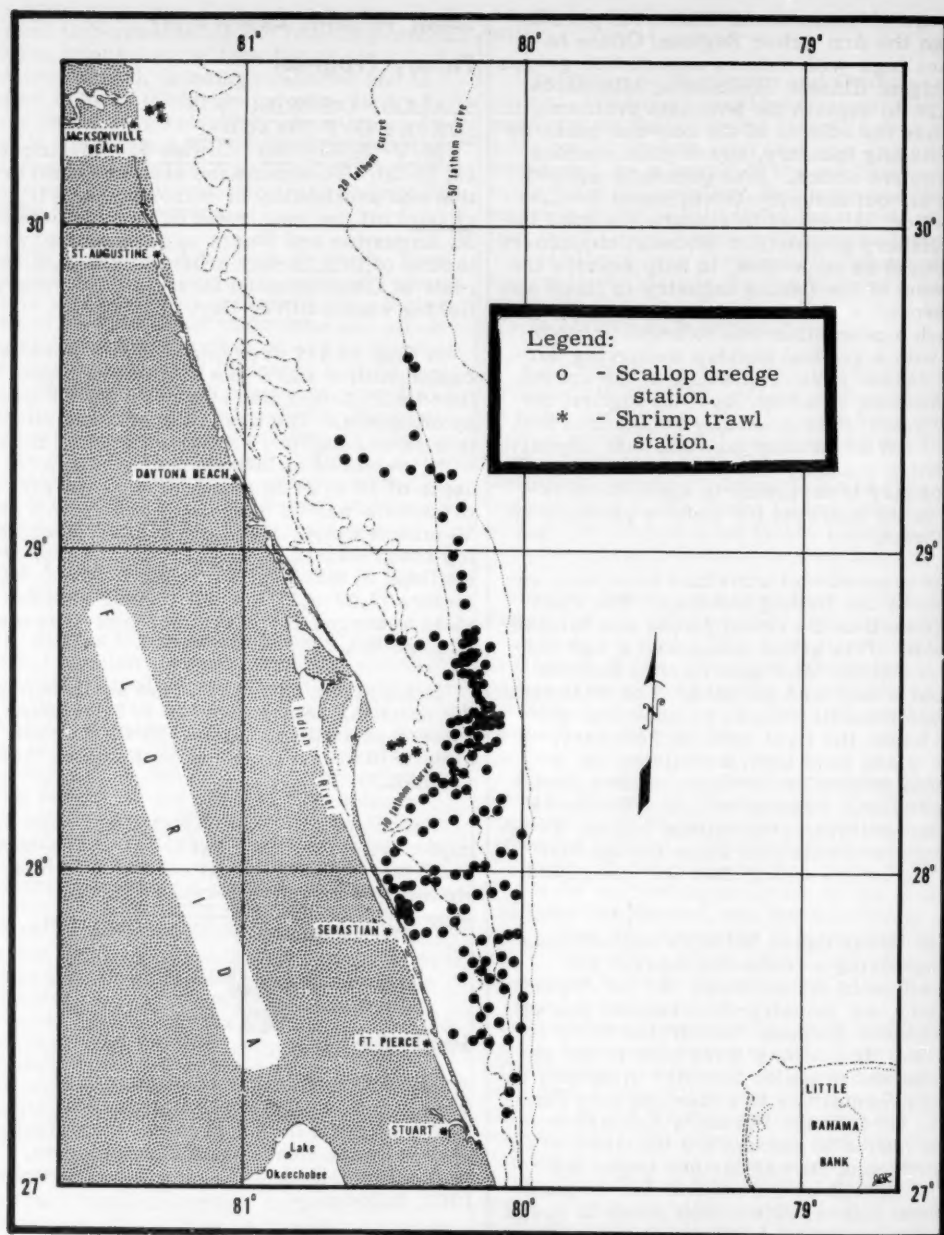


South Carolina

FISHERIES BIOLOGICAL RESEARCH PROGRESS, JULY-DECEMBER 1963:

A report on the progress of biological research by the Bears Bluff Laboratories, Wadmalaw Island, S. C., for July-December 1963, follows:

Oyster Studies: Experiments were continued during the last half of 1963 to test the effectiveness of supplemental feeding of oysters. Experiments were again carried out in



Area investigated off Florida during Cruise S1 of the M/V Silver Bay.

three 12 x 12 foot concrete tanks. The overflow in the tanks was arranged so that each tank held approximately 1,350 gallons of water. Approximately 100 oysters were used in each experiment. Each feeding experiment lasted 30 days. Individual oysters used for controls in one experiment were fed in the second experiment. In some experiments the situation was reversed and oysters which had been fed during one month were used as controls during the second month. In all experiments those oysters which were fed with various forms of carbohydrates increased in weight over the control experiments. In broad generalities, the gain in weight of the fed oysters was usually three times that of the controls. Further work will continue on the supplemental feeding of oysters.

Shrimp Studies: Brown shrimp were slightly more numerous at regular survey stations during the last half of 1963 than in that period of 1962. White shrimp, however, were almost five times less plentiful at regular survey stations from July through December of 1963 as during that time in 1962. Of the major kinds of commercial fish and shellfish sampled by experimental trawling, white shrimp were the only species which showed a marked decline during the last half of 1963 as compared with that period in 1962. The reasons for the decline in the numbers of white shrimp this year are not known, but it is possible that the extremely cold winter of 1962/63 was responsible. White shrimp, considerable numbers of which normally winter-over in coastal sounds and rivers, disappeared from inshore waters during the winter of 1962/63 and very few roe shrimp appeared in the spring of 1963.

Fin Fish: Experimental trawling at regular stations from July through December revealed that croakers were slightly more abundant in inshore waters during that period than during the same period of 1962. The catch for spot was also approximately the same during the two periods, indicating that there has been no major changes in population of those fish during the past two years.

Fish Tagging: Through December 1963, over 300 fish of various species had been tagged with Peterson disc tags and released throughout coastal waters. Only five tags were returned (all by sports fishermen) as of the end of 1963. The principal species tagged were croaker, spot, flounder, pigfish, whiting, sea trout, and black fish. Tags from

two croakers, two pigfish, and one large king whiting were returned. The croakers and pigfish had moved only short distances from the place where they originally were caught and tagged, in spite of the fact that one fish had been free for 85 days before it was caught. The king whiting was caught on hook and line about one month after being tagged and released, approximately 22 miles from where it was originally captured.

This study will continue during 1964 and it is felt that valuable information will be obtained concerning the movements, growth rates, etc., of various species of marine fishes in South Carolina waters.

Blue Crabs: Blue crabs were slightly more abundant in experimental trawling in coastal waters during July through December 1963 as compared with that period of 1962. The average catch per unit of effort for immature crabs at regular survey stations for the July-December period of 1963 was 9.9 crabs, as compared with a catch per unit of effort of 7.5 in 1962. The average catch per unit of effort for adult blue crabs was 15.2 during the 1963 period, whereas in 1962 the average catch per unit of effort was 13.9.

Large female blue crabs were very plentiful in sounds and offshore during November and early December, but the sudden drop in water temperatures in mid-December apparently caused a migration to deeper waters offshore as trawl catches declined markedly at this time.

Pond Cultivation: Two one-acre ponds were harvested in October 1963. One of the ponds, the "fish pond," had been allowed to stock naturally by opening the flood gates on March 11 and allowing postlarval shrimp to "flow" into the pond until it was closed on May 7. The flood gates were reopened again from June 25 to August 30 for further inflowing of postlarval shrimp. The other pond, the "oyster pond," was stocked by hand during May to September with approximately 1,100 shrimp of mixed species. Both ponds were treated with rotenone on May 7 and August 7, 1963 (each pond treated twice), to remove predaceous fishes. Crab pots were used in each pond to remove crabs. As food for the shrimp over 500 pounds of chopped trash fish was put in each pond during June to September.

In 1963 the fish pond yielded 14 pounds of shrimp, heads-on, in 7½ months. However, in

1962 the same pond treated in the same manner yielded a harvest of 163 pounds of shrimp, heads-on, in 4 months.

In 1963 the oyster pond, hand-stocked with 1,100 shrimp, gave a harvest of 855 shrimp weighing 43 pounds 6 ounces in 7½ months. In 1962 the same pond, hand-stocked with 8,164 shrimp, gave a harvest of 15,500 shrimp weighing 238 pounds 14 ounces in 4 months. Obviously in addition to the hand-stocking some shrimp as postlarval or as small juveniles entered the pond naturally when exceptionally high tides forced open the flood gates.

The difference in the yield of the ponds, particularly the fish pond, seems to be a reflection of the scarcity of postlarval shrimp in estuarine waters of South Carolina.

New Research Vessel: On September 7, 1963, the hull of the new research vessel for Bears Bluff Laboratories was launched at Cainhoy, S. C. The boat was designed to fit specifications for estuarine research. She is 58 feet long with a beam of 18 feet and draws only 42 inches of water. After launching, the boat was towed to Wadmalaw Island and a Diesel motor was installed by the staff of the Laboratories. Carpenter work and finishing of cabin, laboratory space, and living quarters is now under way. Trial runs to check the engine were made just before Christmas. The performance of the boat was excellent.

Note: See *Commercial Fisheries Review*, August 1963 p. 51.



Sports Fishing

NEW FEDERAL SPORTS FISHING RESEARCH LABORATORY TO BE BUILT ON UNIVERSITY PROPERTY:

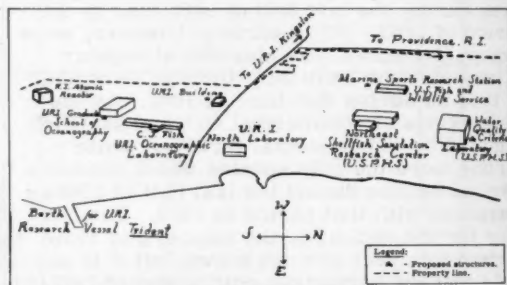
One of the final steps to locate a Federal sports fishing research laboratory in Rhode Island, was taken when the University of Rhode Island President reported on December 16, 1963, that the University and the U. S. Department of the Interior had reached an agreement, allocating a three-acre site of land for the laboratory. The University is processing the deed which will give the Federal Government a parcel of land on its Narragansett Bay Campus, directly to the west of the Northeast Shellfish Sanitation Research Center.

The Narragansett Bay Campus of the University of Rhode Island is well on its way to

becoming one of the world centers for research in the marine sciences, the University's President stated. He added, the location of a third Federal facility in the area will give added impetus to this trend.

He also stated that the area will be of great benefit to the economy of Rhode Island and the nation. Though popularly neglected, there is a growing feeling that research into the sea may hold as great a potential for the future as space science.

The initial Federal investment in the area is expected to exceed \$3.5 million. Counting the staff at the headquarters for the University of Rhode Island Graduate School of Oceanography, this will result in the employment of over 300 scientists, technicians, and staff people.



Sketch showing the site and where proposed structures for the new Federal sports fishing research laboratory is to be built on the University of Rhode Island's Narragansett Bay Campus.

Shortly after receipt of an allotment for site selection and engineering design, the Chief of the Division of Sports Fisheries of the Interior Department's Bureau of Sport Fisheries and Wildlife said his Unit wanted to find out what it takes to produce game fish and how they can spawn in large numbers, and get enough food.

In addition, the Division is interested in studying the effects of pollution and pesticides on fish. The Rhode Island facilities would also be used as a base to move up or down the coast to check fish migration.

Previously, the University donated 5.3 acres of land for the \$1,165,000 Northeast Shellfish Sanitation Research Center, now nearing completion, and 7.2 acres for the proposed \$1,750,000 Water Quality Laboratory. Still another parcel was given to the Rhode Island Atomic Energy Commission for the \$1

million nuclear reactor. (Public Information Department, University of Rhode Island, December 13, 1963.)



Striped Bass

TAG RETURNS SOUGHT FROM LONG ISLAND MARKING PROGRAM:

A total of 579 large striped bass have been tagged along the south shore of Long Island by the New York State Bureau of Marine Fisheries. The fish--ranging in size from 6 to 50 pounds--were marked with red and white plastic disc tags.

The Fish Research Unit of the New York State Bureau of Marine Fisheries late in 1963 had completed a three-year program of tagging striped bass from the surf along the south shore of Long Island (Fire Island), New York. Only fish of six pounds or heavier were tagged in an effort to learn more about the movements and seasonal migration of larger, mature striped bass. Although many thousands of striped bass have been tagged at various times and stations along the Atlantic Coast, very few of the fish have been of considerable size.

Biologists of the U.S. Bureau of Commercial Fisheries, having consolidated and analyzed data from several sources in North Carolina and Chesapeake Bay, concluded that large striped bass which concentrate on the North Carolina coast in winter and in Chesapeake Bay in later winter and spring move northward as far as Massachusetts in spring and summer. It is important to know, from the point of view of striped bass management and utilization, if this great movement is annually cyclic and to learn if fish from the more northern part of this species' extensive range return in the fall as far south as the North Carolina coast and the major southern spawning grounds.

During the past three years almost 4,200 striped bass from the ocean front along Fire Island Beaches were carefully examined and, of those, 579 (about 14 percent) were in the large category. The larger fish--ranging from 6 to 50 pounds--were marked with two red and white plastic, serially numbered Petersen disc tags by fastening the discs on the upper back between the dorsal fins with a stainless steel pin.

For efficient management and utilization, it is important to investigate further the extent and time of striped bass migrations. Cooperation of fishermen is needed to insure the success of the current study. Tags recovered from the striped bass tagged off Long Island should be returned, together with the date and location of capture, to New York State Conservation Department, D-J Fish Research Unit, Oakdale, New York, 11769. A nominal reward of one dollar, as well as information concerning the tagged fish, will be given for each set of red and white discs.



Transportation

RATE INCREASE SOUGHT BY NEW ENGLAND TRUCKERS:

The New England Motor Carrier Rate Bureau held public hearings on December 18, 1963, on its proposal to increase rates and wages approximately 8½ percent to cover higher cost of labor and supplies. Over 100 shippers and trade associations voiced strenuous opposition to the proposal.

This proposal is not intended to cover any increases in wages which may result from the current negotiations between the Teamsters Union and the trucking industry for nationwide wage increases totaling \$200 million a year. It is reported that an official of the Teamsters Union opened the negotiations with a statement that truckers will be required to increase rates 7 percent to cover the cost of increased wages, and should get a 15-percent increase to cover past increases.

REA EXPRESS FILES TARIFFS TO INCREASE CHARGE:

Tariffs have been filed by REA Express which would increase charges on all express movements by 25 cents per shipment effective January 27, 1964. On February 8, 1962, an increase of 10 cents per shipment was effected by this carrier and a widespread adjustment to fishery rates was made in November 1961.

Any protests by the fishing industry on the proposed increase were to be filed with the Interstate Commerce Commission (ICC) before January 17, 1964.

ALASKA-WASHINGTON RAIL-BARGE SERVICE EXPANDED:

A West Coast firm announced the launching, on December 11, 1963, of the Kenai, a hydro-train barge, reported as being the largest ocean vessel of that type ever built. The barge is 342 feet long with a capacity of 42 normal length railroad cars. The Kenai is to be used in weekly sailings from Seattle, Wash., to Whittier, Alaska. It will supplement the service provided by the Clair Engle, the original barge link in the all-rail route between Seattle and Whittier.



Tuna

RESULTS OF BLUEFIN TAGGING IN ATLANTIC OCEAN BY WOODS HOLE OCEANOGRAPHIC INSTITUTION:

Included in the Cooperative Game Fish Tagging Program of the Woods Hole Oceanographic Institution is the bluefin tuna in the Atlantic Ocean. The 1963 report on the game fish-tagging program points out that the most important results concern the bluefin tuna. Increasing commercial pressure on that species is shown by the dramatic increase in returns from the northwestern Atlantic fishing area, from Maryland waters to off southern New England. These rose from a total of 6 for the years 1954-1962 combined to 19 for the 1963 season alone. No less than 7 of 29 bluefin marked in the inshore waters of that area last summer have been already recaptured, as have 4 of 29 marked further offshore early in June, about 120 miles southeast of Nantucket. The other 1963 returns were obtained from 4 fish marked in 1962, 3 in 1961, and 1 in 1960. These returns suggest that in the 1963 season a group of bluefin in the 100-pound class moved west southwest from off Oceanographer Canyon to coastal waters off Ocean City, Md., then northward and eastward to off Block Island and finally into Massachusetts Bay, while smaller individuals moved from off Montauk eastward toward the Martha's Vineyard grounds and then back to the westward again. Unfortunately these samples are too small to be of conclusive statistical significance.

More tags from all species of game fish tagged by the Institution's cooperative game fish-tagging program were returned in 1963 than in the 8 previous years combined.

Since May 1954, about 1,500 bluefin tuna, 4,350 Atlantic sailfish, 2,350 white marlin, 950 Pacific sailfish, 600 striped marlin, 200 blue and black marlins, 750 greater amberjack, 200 yellowfin tuna, and 875 other fish have been marked--a grand total of nearly 12,000 fish. Returns have been obtained from 32 bluefin tuna, 31 Atlantic sailfish, 3 white marlin, 1 striped marlin, 70 greater amberjack, 2 yellowfin tuna (from only 6 Pacific taggings), 7 striped bass, 5 crevalle jack, 1 bar jack, 3 dolphin, 2 great barracuda, 1 fluke, and 1 sea bass--a total of 159 returns.

Participation by individuals and clubs continues to increase, the Institution reports. Acknowledged is the valuable cooperation from the U. S. Bureau of Commercial Fisheries in marking fish and also in recovering tags with the necessary data. Assistance in the latter endeavor has also been furnished by the Inter-American Tropical Tuna Commission and by the Cape Cod Tuna Corporation, Eastport, Maine, and the Maryland Tuna Corporation, Cambridge, Md. Basic financial support for the program is from the National Science Foundation, supplemented by grants from the Charles W. Brown, Jr. Memorial Foundation, the National Geographic Society, the Sport Fishing Institute, the International Game Fish Association, the Van Camp Foundation, the Associates of the Woods Hole Oceanographic Institution, and numerous other organizations and individuals.

Increased tagging of Atlantic bluefin tuna in all possible areas is the Institution's most urgent objective at present. The importance of prompt and accurate reporting of taggings is emphasized. Some very important returns have proved of dubious value due to lack of tagging data.



U. S. Fishing Vessels

FISHERIES LOANS AND OTHER FINANCIAL AID FOR VESSELS, OCTOBER 1-DECEMBER 31, 1963:

From the beginning of the program in 1956 through December 31, 1963, a total of 1,341 loan applications for \$35,872,047 were received by the U. S. Bureau of Commercial Fisheries, the agency administering the Federal Fisheries Loan Fund. Of the total, 689 applications (\$15,737,240) have been approved,

459 (\$11,531,721) have been declined or found ineligible, 157 (\$6,084,422) have been withdrawn by applicants before being processed, and 36 (\$842,733) are pending. Of the applications approved, 273 were approved for amounts less than applied for. The total reduction was \$1,675,931.

The following loans were approved from October 1, 1963, through December 31, 1963:

New England and Middle Atlantic Areas: Bradford Reed, Boothbay Harbor, Maine, \$1,800; Silver Sea, Inc., Boston, Mass., \$25,000; Agatha and Patricia, Inc., Medford, Mass., \$50,000; Dias Fishing Corp., New Bedford, Mass., \$18,296; and Peter Edson Sprague, Narragansett, R. I., \$32,000.

California Area: Michael F. Schroeder, Aptos, \$5,365; Dean Holder, Crescent City, \$6,000; and Donald E. Dodson, Santa Cruz, \$20,000.

Pacific Northwest Area: Frank A. Taylor, Newport, Oregon, \$3,000.

Alaska Area: Fred L. Birch, Auke Bay, \$3,472; Albert Lauth, Craig, \$2,600; and Walter R. and Leota Farmer, Valdez, \$6,000.

Under the Fishing Vessel Mortgage Insurance Program (also administered by the Bureau) during the last quarter of 1963, 6 applications for \$330,162 were received and 1 application for \$36,412 was approved. Since the program began (July 5, 1960), 36 applications were received for \$3,889,129. Of the total, 28 applications were approved for \$2,359,046 and 8 applications for \$1,503,750 were pending as of December 31, 1963. Since the mortgage program began, applications received and approved by area are:

New England Area: Received 10 (\$1025,365), approved 8 (\$775,365);

California: Received and approved 1 (\$557,000);

South Atlantic and Gulf Area: Received 18 (\$780,468), approved 12 (\$437,164);

Pacific Northwest: Received 6 (\$1,486,296), approved 4 (\$507,546);

Alaska: Received 1 (\$40,000). Not yet approved.

No applications for the Fishing Vessel Construction Differential Subsidy were re-

ceived from July through December 31, 1963, as the authority to accept applications expired on June 12, 1963. Since the beginning of that program on June 12, 1960, 13 applications were received for \$1,101,770, of which 6 applications were approved for \$546,103, and 7 applications for \$555,667 were pending.

DOCUMENTATIONS ISSUED AND CANCELLED:

November 1963: During November 1963, a total 37 vessels of 5 net tons and over was issued first documents as fishing craft, as

Area (Home Port)	Nov.		Jan.-Nov.		Total
	1963	1962	1963	1962	
..... (Number)					
Issued first documents 2/:					
New England	1	2	21	27	28
Middle Atlantic	1	-	17	2	3
Chesapeake	6	6	60	41	43
South Atlantic	6	6	71	46	47
Gulf	20	12	229	106	110
Pacific	2	5	152	127	130
Great Lakes	1	1	5	5	5
Puerto Rico	-	2	2	-	2
Total	37	34	557	356	368
Removed from documentation 3/:					
New England	2	1	43	20	24
Middle Atlantic	2	1	44	34	39
Chesapeake	4	1	23	23	23
South Atlantic	2	3	49	38	38
Gulf	11	3	111	98	104
Pacific	7	11	82	103	111
Great Lakes	1	3	14	21	22
Hawaii	-	-	3	3	3
Puerto Rico	-	-	-	1	1
Total	29	23	369	341	365

1/For explanation of footnotes, see table 2.

1/For explanation of footnotes, see table 2.

Gross Tonnage	Issued 2/	Cancelled 3/
..... (Number)		
5-9	6	9
10-19	8	8
20-29	3	5
30-39	1	-
40-49	1	2
50-59	-	2
60-69	3	-
70-79	12	-
80-89	1	3
290-299	1	-
450-459	1	-
Total	37	29

1/Includes both commercial and sport fishing craft. A vessel is defined as a craft of 5 net tons and over.

2/Includes 2 redocumented vessels in November 1963 previously removed from records. Vessels issued first documents as fishing craft were built: 27 in 1963; 1 in 1956; and 9 prior to 1951.

3/Includes vessels reported lost, abandoned, forfeited, sold alien, etc. Source: Monthly Supplement to Merchant Vessels of the United States. Bureau of Customs, U.S. Treasury Department.

compared with 34 in November 1962. There were 29 documents cancelled for fishing vessels in November 1963 as compared with 23 in November 1962.

October 1963: During October 1963, a total of 36 vessels of 5 net tons and over was issued first documents as fishing craft, as compared with 25 in October 1962. There were 28 documents cancelled for fishing vessels in October 1963 as compared with 30 in October 1962.

Table 1 - U. S. Fishing Vessels 1/-- Documentations Issued and Cancelled, by Areas, October 1963 with Comparison					
Area (Home Port)	Oct.		Jan.-Oct.		Total
	1963	1962	1963	1962	
..... (Number)					
<u>Issued first documents 2/:</u>					
New England	2	1	20	25	28
Middle Atlantic	-	-	16	2	3
Chesapeake	9	6	54	35	43
South Atlantic	6	3	65	40	47
Gulf	15	7	209	84	110
Pacific	4	7	150	122	130
Great Lakes	-	1	4	4	5
Puerto Rico	-	-	2	-	2
Total	36	25	520	322	368
<u>Removed from documentation 3/:</u>					
New England	3	-	41	19	24
Middle Atlantic	-	2	42	33	39
Chesapeake	3	3	19	22	23
South Atlantic	2	6	47	35	38
Gulf	13	9	100	95	104
Pacific	7	10	75	92	111
Great Lakes	-	-	13	18	22
Hawaii	-	-	3	3	3
Puerto Rico	-	-	-	1	1
Total	28	30	340	318	365
1/For explanation of footnotes, see table 2.					

1/For explanation of footnotes, see table 2.

Table 2 - U. S. Fishing Vessels -- Documents Issued and Cancelled, by Tonnage Groups, October 1963		
Gross Tonnage	Issued 2/	Cancelled 3/
 (Number)	
5-9	11	7
10-19	6	13
20-29	2	5
30-39	-	1
40-49	1	1
50-59	5	-
60-69	5	-
70-79	5	1
80-89	1	-
100-109	1	-
140-149	2	-
160-169	1	-
240-249	1	-
Total	36	28

1/Includes both commercial and sport fishing craft. A vessel is defined as a craft of 5 net tons and over.

2/Includes 3 redocumented vessels in October 1963 previously removed from records. Vessels issued first documents as fishing craft were built: 29 in 1963; 1 in 1962; 5 prior to 1951; and 1 unknown.

3/Includes vessel reported lost, abandoned, forfeited, sold alien, etc. Source: Monthly Supplement to Merchant Vessels of the United States, Bureau of Customs, U. S. Treasury Department.

U. S. Foreign Trade

IMPORTS OF CANNED TUNA UNDER QUOTA:

United States imports of tuna canned in brine during January 1-November 30, 1963, amounted to 48,238,342 pounds (about 2,297,064 std. cases), according to data compiled by the Bureau of Customs. This was 6.9 percent less than the 51,796,996 pounds (about 2,466,524 std. cases) imported during January 1-December 1, 1962.

The quantity of tuna canned in brine which could be imported into the United States during the calendar year 1963 at the 12½-percent rate of duty was limited to 63,130,642 pounds (or about 3,006,221 std. cases of 48 7-oz. cans). Any imports in excess of the quota were dutiable at 25 percent ad valorem.

IMPORTS OF FISH MEAL AND SCRAP BY CUSTOMS DISTRICTS, OCTOBER 1963:

U. S. imports of fish meal and scrap in October 1963 totaled 31,449 short tons, a decline of 9.3 percent from the 34,666 tons imported in the previous month, but a sharp increase from the 12,732 tons imported in October 1962.

About 87.9 percent of the fish meal and scrap imports in October 1963 entered through the Customs Districts of Maryland, Georgia, Mobile (Ala.), Galveston (Tex.), Los Angeles (Calif.), San Francisco (Calif.), and Washington.

U. S. Imports of Fish Meal and Scrap by Customs Districts, October 1963	
Customs Districts	October 1963
	Short Tons
Maine and New Hampshire	120
Maryland	6,338
North Carolina	1,378
Georgia	4,253
Mobile (Ala.)	4,435
Sabine (Tex.)	1,114
Galveston (Tex.)	2,989
Los Angeles (Calif.)	2,639
San Francisco (Calif.)	4,063
Washington	2,943
Dakota	195
Duluth (Minn.) and Superior (Wis.)	456
Michigan	397
Other Customs Districts	1/129
Total	31,449

1/Includes 30 tons of fish meal classified as fertilizer.

Note: A list of the entry ports included within each Customs District is given in Schedule D, Code Classification of United States Customs Districts and Ports, which may be obtained free from the Foreign Trade Division, Bureau of the Census, U. S. Department of Commerce, Washington, D. C. 20533.

TRENDS IN UNITED STATES EXPORTS OF FISHERY PRODUCTS BY COUNTRY, 1962:

In 1962, the annual value of United States exports increased slightly over 1961. The value of fishery products exported during 1962 was \$35,728,000, up 3 percent from the previous year.

Table 1 - Value of United States Exports of Fishery Products, 1953-1962

Year	Edible	Inedible	Total
 (US\$1,000)		
1962	22,470	13,258	35,728
1961	19,594	15,116	34,710
1960	25,622	18,543	44,165
1959	26,747	17,495	44,242
1958	19,440	11,564	31,004
1957	20,549	15,403	35,952
1956	22,939	16,564	39,503
1955	24,923	15,054	39,977
1954	16,238	15,289	31,527
1953	17,084	10,794	27,878

Trend by Countries: During 1962, U.S. fishery products were exported to 103 countries. Of total exports, 63 percent was shipped to five countries: Canada, United Kingdom, Netherlands, Switzerland, and West Germany (table 2).

Table 2 - United States Exports of Fishery Products by Selected Countries of Destination, 1958-62

Country	1962	1961	1960	1959	1958
 (US\$1,000)				
Canada	8,846	10,265	10,309	8,644	9,200
United Kingdom	8,249	4,554	8,460	8,928	5,785
Netherlands	2,273	2,385	4,350	4,352	2,007
Switzerland	1,712	738	1,082	762	387
West Germany	1,467	1,555	2,201	2,888	3,043
Sweden	1,076	1,665	2,613	3,176	681
France	1,073	1,007	1,048	766	68
Japan	939	2,984	3,295	928	501
Italy	869	423	643	303	158
Belgium and Luxembourg	547	351	537	746	948
Greece	487	364	313	306	136
Norway	403	2,390	1,390	1,296	1,063
Hong Kong	383	368	269	229	127
Mexico	375	459	616	663	393
Philippines	320	582	2,494	5,587	2,578
Venezuela	274	360	461	614	641
Cuba	243	-	175	787	490
Australia	198	458	444	157	31
Ecuador	171	82	293	193	236
Other	5,823	3,720	3,172	2,917	2,531
Total	35,728	34,710	44,165	44,242	31,004

CANADA: Canada has been the principal market for United States fishery products. In 1962, Canada took products valued at \$8,846,000 or about 25 percent of the total U.S. exports of fishery products. Fresh or frozen fish and shellfish made up most of the U.S. exports of fishery products to Canada. Some of the important commodities exported to Canada were:

	1962	1961
Shrimp, fresh or frozen	\$2,081,000	\$1,675,000
Shrimp, canned	1,462,000	1,570,000
Seal furs	1,024,000	1,777,000
Fish, fresh or frozen	766,000	891,000
Fish, shellfish, and other marine animal products, inedible	703,000	703,000
Shellfish, fresh or frozen	1,874,000	2,928,000
Other	936,000	722,000
Total	\$8,846,000	\$10,266,000

UNITED KINGDOM: In 1962, exports to the United Kingdom rose to the 1959 and 1960 level of \$8,000,000, an

81-percent increase over 1961. Sharp increases in the major commodities accounted for this rise as fish oil alone more than doubled in value. Major fishery commodities exported to the United Kingdom were:

	1962	1961
Salmon, canned	\$5,622,000	\$3,056,000
Fish and marine animal oils	1,511,000	568,000
Shrimp, canned	682,000	557,000
Salmon, fresh or frozen	138,000	141,000
Other	296,000	232,000
Total	\$8,249,000	\$4,554,000

OTHER COUNTRIES: Exports to Norway, Sweden, Netherlands, and West Germany consisted mainly of fish oils. Switzerland took largely seal furs. Principal products exported to Japan were frozen shrimp and unmanufactured shells. France received significant amounts of frozen salmon and canned and frozen shellfish.

Trend by Areas: During 1962, Europe remained the principal destination for fishery products exported from the United States (table 3). Products valued at \$18,800,000 or 53 percent of total exports went to Europe. North America was second with \$10,856,000 or 30 percent.

Table 3 - United States Exports of Fishery Products by Area of Destination, 1962

Area	Edible	Inedible	Total
 (US\$1,000)		
North America	8,104	2,752	10,856
Asia	2,234	1,385	3,619
Europe	9,957	8,843	18,800
South America	572	135	707
Africa	1,220	97	1,317
Oceania	383	46	429
Total	22,470	13,258	35,728

Trend by Commodities: Canned salmon was the principal dollar earner among U.S. fishery exports. Fish oil was second in importance. Exports of seal furs showed some gain with Canada and Switzerland taking 65 percent of the total.

Table 4 - Value of United States Exports of Fishery Products by Selected Commodities, 1958-62

Commodity	1962	1961	1960	1959	1958
 (US\$1,000)				
Fish oils	6,047	8,908	10,688	11,902	7,761
Seal furs	3,851	3,097	3,309	2,580	1,511
Shells, unmanufactured	1,285	1,380	2,636	977	624
Miscellaneous fish (mostly fresh-water), fresh or frozen	1,135	809	947	622	1,036
Oysters, shucked	311	448	497	575	567
Salmon:					
Fresh	872	647	1,677	659	476
Cured	528	593	435	372	357
Canned	7,292	5,580	9,830	10,639	6,669
Mackerel, canned	671	581	211	135	333
Miscellaneous fish (mostly California anchovies), canned	460	391	355	326	496
Sardines, canned not in oil	1,285	1,336	3,443	5,843	3,231
Shrimp:					
Fresh or frozen	3,299	3,694	2,303	1,682	1,463
Canned	2,572	2,487	3,383	2,898	2,548
Squid, canned	729	353	691	906	501

TRENDS IN UNITED STATES FISHERY IMPORTS, BY COUNTRY 1962:

The value of annual imports of fishery products entering the United States increased to a new high in 1962. In that year, 113 countries shared in the United States market for fishery products. The value of fishery products imported was \$475,248,000--19.7 percent over the 1961 value. The imports of edible fishery products amounted to \$400,882,000; inedible \$74,366,00.

Trend by Countries: Canada, Japan, and Mexico continued to be the leading suppliers of fishery products to the United States (table 1). These countries accounted for 58 percent of the value of fishery imports. Canada provided 24 percent of the total, Japan 22 percent, and Mexico 11 percent. Peru, South Africa Republic, Norway, Australia, and Iceland were the next leading suppliers with imports ranging from \$11,000,000 to \$24,000,000. Imports from Brazil, El Salvador, Ecuador, Panama, Portugal, India, and Denmark, each were valued over \$5,000,000.

CANADA: Canada, with fishery products valued at \$116,168,000, continued to be the principal supplier of fishery products to the United States. The value of fishery imports increased 7.5 percent over 1961. Leading commodities were as follows:

	1962	1961
Fresh or frozen:		
Lobster	\$ 15,000,000	\$ 14,570,000
Fresh-water fish	11,737,000	12,173,000
Fish blocks	15,162,000	14,294,000
Groundfish fillets	12,526,000	11,581,000
Salmon	5,298,000	5,860,000
Halibut	7,791,000	6,133,000
Flounder fillets	5,422,000	5,210,000
Fresh-water fillets	2,187,000	5,404,000
Scallops	4,810,000	3,322,000
Other fresh or frozen	7,310,000	5,110,000
Canned lobster	5,507,000	4,682,000
Fish meal and scrap	5,193,000	3,544,000
Cod, haddock, etc., pickled or salted	6,698,000	7,420,000
Other fishery products	11,527,000	8,732,000
Total	\$116,168,000	\$108,035,000

JAPAN: The value of fishery imports from Japan was \$105,246,000, an increase of 19 percent over 1961. Tuna and pearls remained the leading commodities. U.S. imports of fishery products from Japan were as follows:

	1962	1961
Fresh or frozen:		
Albacore	\$ 9,759,000	\$ 8,544,000
Albacore loins and discs ..	669,000	1,127,000
Other tuna	16,025,000	9,462,000
Other loins and discs	3,118,000	1,626,000
Shrimp	2,740,000	1,201,000
Swordfish	6,232,000	6,391,000
Fresh-water trout	747,000	776,000
Frog legs	1,362,000	740,000
Canned:		
Light meat tuna in brine ..	12,053,000	11,269,000
White meat tuna in brine ..	7,912,000	7,487,000
Salmon	2,238,000	2,667,000
Crab meat	4,635,000	5,756,000
Clams	809,000	972,000
Pearls, cultivated	17,934,000	16,136,000
Other	19,013,000	14,107,000
Total	\$105,246,000	\$88,261,000

MEXICO: Mexico ranked third as a supplier of fishery products to the United States. Shrimp was the principal commodity. Mexico furnished 51 percent of the total value of all U.S. shrimp imports. The value of imports from Mexico is:

	1962	1961
Shrimp	\$46,700,000	\$40,094,000
Other	6,827,000	5,672,000
Total	\$53,527,000	\$45,766,000

OTHER COUNTRIES: Other leading suppliers of fishery products to the United States market are listed below showing the principal product shipped and the value of U.S. imports of that product:

South Africa Republic - Rock lobster tails ..	\$14,277,000
Peru - Fish meal	16,828,000
Australia - Lobster, frozen	13,867,000
Panama - Shrimp	7,787,000
Norway - Sardines in oil, not skinned	7,625,000
El Salvador - Shrimp	4,982,000
Brazil - Rock lobster tails	4,538,000
Ecuador - Shrimp	1,823,000
Portugal - Sardines in oil, skinned	3,001,000

Area of Origin: During 1962, North American countries continued to be the principal source of supply for fishery products imported into the United States (table 2).

Products valued at \$192,624,000 or 41 percent of total fishery imports came from North American sources. Imports from Asian countries were second, Europe third.

Table 1 - Value of United States Imports of Fishery Products (Edible and Inedible) by Selected Countries of Origin, 1962 1/					
Country	1962	1961	1960	1959	1958
	..(US\$1,000).....				
Canada	116,168	108,035	102,877	101,967	107,005
Japan	105,246	88,263	85,256	96,226	84,872
Mexico	53,527	45,766	36,705	32,869	28,005
Peru	24,819	16,729	14,270	16,374	10,907
So. Afr. Rep.	19,688	14,468	12,030	12,090	9,332
Norway	18,937	15,101	12,506	16,405	12,087
Australia	7,884	6,707	5,767	6,458	5,852
Iceland	11,602	11,528	9,306	10,000	8,775
Repub. of Pan. ..	7,884	6,707	5,767	6,458	5,852
Brazil	6,825	5,074	3,916	3,002	2,359
Denmark	6,553	5,246	4,342	8,239	5,728
Ecuador	6,443	4,619	4,467	4,159	3,510
Portugal	5,983	6,525	5,289	5,452	5,177
India	5,638	2,777	2,363	2,239	1,547
El Salvador	5,100	5,510	4,215	1,297	860
W. Germany	4,499	4,160	4,100	1,814	1,805
Netherlands	2,997	1,736	2,562	2,626	1,509
France	2,457	2,087	2,317	2,230	1,169
United Kingdom ..	2,520	2,309	1,759	2,368	1,787
Chile	2,155	2,089	2,630	1,282	2,007
Angola	554	500	267	3,023	2,065
Cuba	98	1,793	3,901	4,810	5,542
Other	50,671	35,180	29,381	23,368	17,806
Total	475,248	397,058	360,065	366,500	327,171

1/Value at the foreign port of shipment.

Table 2 - Value of United States Imports of Fishery Products, by Area of Origin, 1962 1/			
Area	Edible	Inedible	Total
	..(US\$1,000).....		
North America	184,885	7,739	192,624
South America	30,493	23,114	53,607
Europe	51,177	10,504	61,681
Asia	89,551	29,979	119,530
Oceania	20,727	480	21,207
Africa	24,049	2,550	26,599
Total	400,882	74,366	475,248

1/Value at the foreign port of shipment.

Table 3 - Value of United States Imports of Fishery Products, by Selected Commodities, 1958-62 1/

Commodity	1962	1961	1960	1959	1958
.....(US\$1,000).....					
Edible Products:					
Fresh or frozen:					
Shrimp.....	91,898	68,538	56,406	52,306	43,162
Tuna.....	45,715	30,228	31,713	29,728	25,377
Groundfish fillets and blocks	46,937	42,595	33,265	38,759	30,431
Lobster.....	57,182	49,039	44,768	38,635	35,661
Other.....	71,822	63,547	61,845	60,940	63,243
Total fresh or frozen....	313,554	253,947	227,997	220,368	197,874
Canned:					
Tuna.....	22,884	22,175	19,142	21,688	16,882
Salmon.....	3,435	3,545	7,541	11,130	11,271
Sardines.....	16,291	12,543	9,115	8,370	8,564
Crab meat....	4,701	5,780	5,514	7,947	6,116
Lobster.....	5,811	4,779	5,239	6,441	3,952
Other.....	18,878	17,530	16,067	17,083	15,561
Total canned....	72,000	66,352	62,618	72,659	62,346
Other edible products.....	15,328	15,458	16,765	18,006	19,992
Inedible products:					
Fish meal.....	24,298	16,740	11,068	15,884	11,335
Pearls.....	18,935	16,925	14,563	13,678	10,944
Other.....	31,133	27,636	27,054	25,905	24,680
Total inedible....	74,366	61,301	52,685	55,467	46,959
Total fishery imports.....	475,248	397,058	360,065	366,500	327,171

1/Value at the foreign port of shipment.

Duties Collected: Duties collected on imports of fishery products into the United States during 1962 were \$17,910,000 or 6 percent higher than in 1961. Duties collected (with the average ad valorem equivalent) for the years 1958-62 are listed below:

Year	Duties Collected	Average Ad valorem Equivalent (Percent)
1962	\$17,910,000	3.8
1961	16,904,000	4.3
1960	15,837,000	4.4
1959	17,737,000	4.8
1958	16,645,000	5.1



Wholesale Prices

EDIBLE FISH AND SHELLFISH, DECEMBER 1963:

The December 1963 wholesale price index for edible fish and shellfish (fresh, frozen, and canned) rose 1.3 percent from the previous month as a result of higher prices for most fishery products. Compared with December 1962, the index in December 1963 at 107.5 percent of the 1957-59 average was lower by 11.1 percent. Prices during the same month a year earlier were substantially higher for nearly all items in the index.

The drawn, dressed, or whole finfish subgroup index dropped 2.2 percent from November to December 1963 and



was down 14.0 percent from December 1962. Prices at New York this December were lower for frozen dressed king salmon (down 4.8 percent) and frozen western dressed halibut (down about 1.0 percent). A sharp drop in prices for fresh Lake Superior whitefish (down 26.8 percent) at Chicago was partly offset by higher prices for Great Lakes round yellow pike at New York and an increase in prices for ex-vessel large haddock (up 6.7 percent) at Boston because of lighter landings. Compared with December 1962, wholesale prices in December 1963 were lower for all products in the subgroup—halibut (down 24.4 percent), king salmon (down 12.7 percent), fresh large haddock (down 7.5 percent), and Lake Superior whitefish (down 40.6 percent).

Higher prices in December 1963 for South Atlantic fresh shrimp (up 12.4 percent) at New York City and for fresh haddock fillets (up 5.3 percent) at Boston were responsible for a 4.0-percent increase from the previous month in the subgroup index for processed fresh fish and shellfish. December prices for standard shucked oysters at Norfolk were down 3.2 percent from the previous month as production got into full swing. Compared with December 1962, fresh shrimp prices in December 1963 were down 22.4 percent. Prices for other items in the subgroup also were lower than a year earlier bringing the December 1963 subgroup index down by 13.2 percent.

Higher prices in December 1963 for all processed frozen fish and shellfish products caused a 2.7-percent increase from the previous month in the subgroup index. A rising trend in frozen shrimp prices (wholesale price up 2 cents a pound at Chicago) was indicated in December 1963 although those prices were still sharply lower (down 24.8 percent) than a year earlier. Prices for small haddock fillets and ocean perch fillets also rose from November to December because of seasonally light landings. The December 1963 subgroup index was down 13.0 percent from the same month a year earlier mainly because of lower frozen shrimp prices and a slight drop in prices for flounder fillets.

Prices for canned fish products were generally higher in December 1963 as a result of low end-of-the-year stocks and the subgroup index rose 1.3 percent from the previous month. As compared with December 1962, prices in December 1963 were lower for all canned fish and the subgroup index was down by 6.3 percent.

Wholesale Average Prices and Indexes for Edible Fish and Shellfish, December 1963 with Comparisons								
Group, Subgroup, and Item Specification	Point of Pricing	Unit	Avg. Prices 1/		Indexes (1967-69=100)			
			(\$)		Dec. 1963	Nov. 1963	Oct. 1963	Dec. 1962
			Dec. 1963	Nov. 1963				
ALL FISH & SHELLFISH (Fresh, Frozen, & Canned)					107.5	106.1	106.8	120.9
Fresh & Frozen Fishery Products:					110.5	109.0	110.0	127.6
Drawn, Dressed, or Whole Fish:					114.4	117.0	121.8	133.1
Haddock, lge., offshore, drawn, fresh	Boston	lb.	.17	.16	133.0	124.7	104.0	143.8
Halibut, West., 20/80 lbs., drsd., fresh or froz.	New York	lb.	.33	.33	96.1	97.1	129.9	127.1
Salmon, King, lge. & med., drsd., fresh or froz.	New York	lb.	.35	.39	118.0	124.0	132.7	135.2
Whitefish, L. Superior, drawn, fresh	Chicago	lb.	.41	.56	61.2	83.6	78.3	103.0
Yellow pike, L. Michigan & Huron, rnd., fresh	New York	lb.	.51	.46	83.5	75.3	83.5	88.5
Processed, Fresh (Fish & Shellfish):					111.5	107.2	106.6	128.5
Fillets, haddock, sm., skins on, 20-lb. tins	Boston	lb.	.57	.54	138.0	131.1	114.1	139.8
Shrimp, lge. (26-30 count), headless, fresh	New York	lb.	.82	.73	95.5	85.0	87.9	123.1
Oysters, shucked, standards	Norfolk	gal.	7.50	7.75	126.5	130.7	128.6	132.8
Processed, Frozen (Fish & Shellfish):					101.3	98.6	97.5	116.4
Fillets, Flounder, skinless, 1-lb. pkg.	Boston	lb.	.39	.39	98.9	98.9	100.1	100.1
Haddock, sm., skins on, 1-lb. pkg.	Boston	lb.	.40	.38	115.8	111.4	114.3	107.0
Ocean perch, lge., skins on 1-lb. pkg.	Boston	lb.	.35	.34	121.0	119.2	118.4	117.5
Shrimp, lge. (26-30 count), brown, 5-lb. pkg.	Chicago	lb.	.78	.76	91.9	89.5	86.0	122.2
Canned Fishery Products:					102.5	101.2	101.7	109.4
Salmon, pink, No. 1 tall (16 oz.), 48 cans/cs.	Seattle	cs.	23.50	23.25	102.4	101.3	102.4	111.1
Tuna, lt. meat, chunk, No. 1/2 tuna (6-1 1/2 oz.), 48 cans/cs.	Los Angeles	cs.	11.06	10.88	98.2	96.6	96.6	104.4
Mackerel, jack, Calif., No. 1 tall (15 oz.), 48 cans/cs.	Los Angeles	cs.	5.75	5.75	97.5	97.5	97.5	2/100.0
Sardines, Maine, keyless oil, 1/4 drawn (3-3/4 oz.), 100 cans/cs.	New York	cs.	8.96	8.84	114.9	113.3	113.3	119.4

1/Represent average prices for one day (Monday or Tuesday) during the week in which the 15th of the month occurs. These prices are published as indicators of movement and not necessarily absolute level. Daily Market News Service "Fishery Products Reports" should be referred to for actual prices.

2/New product replaced California canned sardines starting December 1962; entered wholesale price index at 100 under revised procedures of Bureau of Labor Statistics.



DDT RESISTANCE SEEN IN MINNOW-LIKE FISH

Mosquitofish (*Gambusia affinis*), a top-feeding minnow found in the southern United States and other warm climates, is believed to be the first fish to demonstrate an apparent resistance to DDT. Mosquitofish are valuable in the destruction of mosquito larvae because of their surface feeding habits.

Three Mississippi scientists reported that mosquitofish from waters near cotton fields that had been longtreated with chlorinated hydrocarbon pesticides showed a marked resistance to DDT compared with fish from areas where insecticides had not previously been used. They tested 1,175 fish.

In the past mosquitofish usually died within a few hours after exposure to DDT. Among vertebrates, fish are notable for their susceptibility to pesticides, although resistance among insects is quite common, and two species of frogs have been found resistant.

Scientists from Mississippi State University, said "one could easily imagine that a genetically resistant population (of mosquitofish) might result from periodic applications of insecticide." (*Science News Letter*, 83:73, February 2, 1963.)



FOREIGN

International

EUROPEAN FISHERIES CONFERENCE

MEETING OPENS IN LONDON:

The European Fisheries Conference met in London December 3-6, 1963, and then adjourned until January 8, 1964. The British Government had invited 16 nations to the conference, including the member countries of the European Free Trade Association (EFTA) and the European Economic Community (EEC) as well as Iceland, the Irish Republic, and Spain. The following statement was issued after adjournment of the December talks:



"At the invitation of Her Majesty's Government, a conference met in London from the third to the sixth of December to discuss the solution on a European basis of certain fisheries problems.

"The conference discussed the following agenda: (1) freedom of fishing and access to fishing grounds, (2) access to markets, (3) fisheries policing, and (4) miscellaneous.

"Particular attention was given to the possibility of reaching agreed arrangements on access to fishing grounds. The desirability of establishing the conditions for liberal trade policies for fish was emphasized. The conference recognized the importance of effective conservation measures in the common interest. There was general agreement on the need for devising a modern code governing the conduct of fishing operations to bring up to date on a wider basis the provisions of the North Sea Fisheries Convention of 1882.

"On access to fishing grounds, proposals for defining the regime that might govern extensions of fishery jurisdiction were put forward by certain delegations. In order to give time for further study of these proposals and of other proposals made under other items of the agenda, the conference adjourned on Friday, December 6, until the 8th of January, 1964, when it will continue its discussions with the same agenda."

(Editor's Note: The British Government issued the invitation for the European Fisheries Conference in the spring of 1963 at the same time that it announced its intention to withdraw from certain international fishery agreements which limited its freedom of action regarding the extension of fishing limits.)

Note: See Commercial Fisheries Review, July 1963 p. 95.

FISH MEAL

PRODUCTION, AUGUST-OCTOBER 1963:

World fish meal production in August-October 1963 totaled 470,192 metric tons (163,310 tons in August, 152,775

World Fish Meal Production by Countries, August-October 1963				
Country	Aug.-Oct.		Jan.-Oct.	
	1963	1962	1963	1962
.....(Metric Tons).....				
Canada	21,338	15,639	64,583	64,832
Denmark	28,229	34,218	87,170	84,788
France	3,300	3,300	11,000	11,000
German Federal Rep.	19,211	18,681	63,792	61,998
Netherlands	1/	1,400	2/ 1,900	4,300
Spain	6,153	5,896	17,022	21,725
Sweden	1,843	1,252	5,174	3,758
United Kingdom	17,617	17,261	63,716	62,196
United States	75,822	94,097	192,020	255,044
Angola	6,854	9,108	21,394	24,666
Iceland	32,383	41,338	78,267	92,762
Norway	40,164	40,061	109,907	107,239
Peru	162,690	209,480	903,437	819,638
So. Afr. (incl. S.W. Afr.)	54,588	20,437	233,072	200,753
Total	470,192	512,168	1,852,454	1,814,699

1/Data not available.

2/Data available only for January-June.

Note: Belgium, Chile, Japan, and Morocco do not report their fish meal production to the International Association of Fish Meal Manufacturers at present.

International (Contd.):

tons in September, and 154,107 tons in October), according to preliminary data from the International Association of Fish Meal Manufacturers. Production in August-October 1963 was down 8.2 percent from that in the same period of 1962. The decline was due mainly to small output in Peru, the United States, Iceland, and Denmark, which was only partly offset by greater production in South Africa and Canada.

Most of the principal countries producing fish meal submit data to the Association monthly (see table).

World fish meal production during the first 10 months of 1963 was only about 2.1 percent greater than in the same period of the previous year. Production in 1963 was boosted by heavier landings of anchoveta in Peru and industrial fish in South Africa, but there was a sharp decline in production in the United States.

Peru accounted for 48.8 percent of total fish meal production during January-October 1963, followed by South Africa with 12.6 percent and the United States with 10.3 percent.

FOOD AND AGRICULTURE ORGANIZATION:

FISHERY PRODUCTS IN THE WORLD FOOD PROGRAM:

The United Nations (UN) and its specialized agency, the Food and Agriculture Organization (FAO), have a joint World Food Program for the multilateral use and distribution of surplus foods. The initial experimental three-year program approved by the FAO Conference in November 1961, and shortly thereafter by the United Nations, has aimed at creating a fund of \$100 million in commodities, services, and cash contributed by member governments of the UN and FAO. An Intergovernmental Committee of 20 nations has been established to provide guidance on policy, administration, and operations. The Fourth Session of the Intergovernmental Committee was held in Rome, November 4-9, 1963.

As of October 31, 1963, donor countries had pledged about \$90 million in commodities, services, and cash to the World Food Program. Commodities committed or earmarked for delivery to recipient countries totaled \$27,330,000.

Fishery products have become an important part of the World Food Program. Of the commodities committed or earmarked for delivery so far, fishery products are the third most important category exceeded only by cereal and cereal products and dairy products. As of October 31, 1963, about 4,185 metric tons of canned and dried fish had been either earmarked or delivered (see table); those products were valued at \$1,935,000. The donor countries for dried fish have been Canada, Norway, the Federal Republic of Germany, India, and Belgium. The principal donor countries for canned fish have been the Netherlands, Sweden, Canada, and Norway. The fishery products donated have gone to a large number of countries in Africa, Asia, and Latin America.

Of the \$90 million so far pledged, the United States has agreed to donate \$40 million in commodities, \$4 million in shipping and services, and \$6 million in cash. Presently, the only United States agricultural products that are being earmarked for delivery are those held by the Commodity Credit Corporation. Authority for disposal of such products comes under Title II of Public Law 480. By an amendment to PL 480, fishery products will be eligible after January 1, 1965, under the provisions of Title I, and they were eligible as of December 16, 1963, under Title IV.



World Food Program Fishery Products Pledged and Earmarked as of October 31, 1963		
Type of Fish and Donor Country	Earmarkings and Deliveries	
	Quantity	Country of Destination
	Metric Tons	
Dried fish:		
Belgium	38.0	Togo
	300.0	Indonesia
Total	338.0	
Canada	188.0	Br. Guiana
	465.0	Pakistan
	63.0	Bolivia
	310.0	Colombia
	150.0	Indonesia
Total	1,176.0	
German Federal Republic	146.0	Tanganyika
	64.0	Ruanda
	10.0	Zanzibar
	5.7	Chile
	65.0	Korea
	92.0	Senegal
Total	382.7	
India	38.0	Korea
	200.0	Indonesia
	35.0	Pakistan
	33.0	Ceylon
Total	306.0	
Norway	400.0	Indonesia
	50.0	Tanganyika
	28.0	Bolivia
	65.0	Korea
	70.0	Tobago
	175.0	Jamaica
Total	788.0	
Total dried fish	2,990.7	
Canned fish:		
Canada	110.0	Br. Guiana
Tunisia	30.0	Ghana
Sweden	280.0	Ghana
	169.0	Iraq
Total	449.0	
Norway	48.0	Bolivia
	60.0	Ghana
Total	108.0	
Netherlands	55.0	Thailand
	60.0	Tobago
	29.0	Mauritania
	175.0	Jamaica
	100.0	Indonesia
	88.0	Sarawak
Total	507.0	
Total canned fish . . .	1,204.0	
Grand total, dried and canned fish	4,194.7	

Note: Total value of dried and canned fish, as of October 31, 1963, was \$1,935,000.

International (Contd.):

**TWELFTH SESSION OF THE
FAO CONFERENCE:**

The Food and Agriculture Organization of the United Nations holds a biennial conference to enable its member countries to review past programs, consider and approve the program of work and budget for the coming two years, and to evaluate long-term trends and programs. There are now 106 full member countries of FAO and 6 associate members. The 12th Session of the FAO Conference, held in Rome, Italy, October 31 to December 5, 1963, began with meetings of six technical committees—one each for fisheries, forestry, agriculture, nutrition, economics, and information.

Government fisheries advisers on the United States Delegation to the 12th Session were H. E. Crowther, Deputy Di-

rector, Bureau of Commercial Fisheries, and Sidney Shapiro, Chief, Branch of Foreign Fisheries, Bureau of Commercial Fisheries.

Early in the discussions of the Technical Committee it became evident that a majority of the delegates were deeply concerned with the status of fisheries work in FAO. During the last decade, FAO has undergone reorganizations which have created a large number of divisions from the original five (Economics, Fisheries, Forestry, Nutrition, and Agriculture) that had been established in 1945 and 1946. The Fisheries Division has now become one of six divisions in the Technical Department. Also a Department of Economic and Social Services has been created with four divisions heavily engaged in agricultural work. With such a proliferation of divisions and departments, the Fisheries Division has become far removed from the Director-General's Office and has not received attention commensurate with the



Fishery advisers on the U. S. Delegation to the 12th Session of the FAO Conference. From left, Charles R. Carry, Executive Director, California Fish Cannery Association; H. E. Crowther, Deputy Director, Bureau of Commercial Fisheries; and Sidney Shapiro, Chief, Branch of Foreign Fisheries, Bureau of Commercial Fisheries.

rector, Bureau of Commercial Fisheries, and Sidney Shapiro, Chief, Branch of Foreign Fisheries, Bureau of Commercial Fisheries. Charles R. Carry, Executive Director, California Fish Cannery Association, served as industry adviser on the delegation. W. M. Chapman, Director of the Van Camp Foundation, attended the sessions of the Technical Committee on Fisheries as an observer.

Delegates from about 45 countries participated in the meetings of the Technical Committee on Fisheries. In past FAO Conferences representation at the technical meetings had been good, but many of the delegates had been either local embassy officers of their respective governments or agricultural representatives. The Technical Committee on Fisheries of the 12th Session was composed mainly of experienced fisheries men, and the meetings of the commit-

tee were the most productive of any held since the establishment of FAO.

growing importance of fisheries in supplying high-quality protein to peoples in many parts of the world. Also, FAO's Fisheries Division has been taking a secondary role in international governmental and nongovernmental programs concerned with fishery research and development.

The United States representatives to the Technical Committee on Fisheries presented a statement which highlighted the Fisheries Division's difficulties and expressed the feeling among United States fisheries people that international activities related to the oceans and inland waters were not properly organized in the United Nations family in a manner that would insure maximum effectiveness. Representatives from many other countries strongly supported this statement, and expressed unanimous concern at what they considered was the inadequacy both of staff and funds available

International (Contd.):

to the Fisheries Division for dealing with problems within its constitutional rights. The representatives were also concerned with the inadequacy of the Division to assume its responsibility as coordinator of the fishery activities of the many international governmental and nongovernmental bodies that deal with problems related to fisheries, the solution of which is so essential for supplying the world with high-quality protein foods.

The Technical Committee on Fisheries drafted a resolution which was later approved by the full FAO Conference. This resolution has considerable importance for the long-term position of FAO's Fisheries Division, not only with regard to raising its status in FAO but to making it the leading intergovernmental body in encouraging rational harvesting of food from the oceans and inland waters. It is expected that proposals for reorganizing the Fisheries Division will be presented by the Director-General of FAO to the next meeting of the FAO Council, which is scheduled for September 1964 in Rome.

The Technical Committee on Fisheries, and later the FAO Conference, approved the 1964-65 program of work and budget proposed for the Fisheries Division by the Director-General. Included in that budget were four new professional positions (with supporting staff), as follows: (1) A marine fisheries biologist to handle the work of the Advisory Committee on Marine Resources Research and to work on specific matters such as tuna research and methods of determining fish abundance; (2) a fish processing technologist to work on the development of new fishery products; (3) a fish processing technologist to work on UNICEF-related projects; and (4) a fisheries economist to work on an expanded project for the development of protein production.

In addition to the approved budgeted posts, the Technical Committee on Fisheries and the FAO Conference approved strengthening of four additional areas of work: (1) Stock assessment studies and the analysis of catch, fishing effort, and biological statistics on whales, tunas, and other species; (2) development of management practices in the inland fisheries of developing countries; (3) fishing boat design; and (4) regional fisheries work in East Africa. The cost of the additional posts needed to conduct these four areas of work was estimated to be \$143,600 for the coming biennium.

The Conference approved a total FAO budget of \$38,838,300 for 1964-65, and requested that the Director-General make appropriate adjustments within FAO in order to take into account the requests for new posts that were submitted by all the Technical Committees, and approved by the full Conference. The total budget voted by the FAO Conference was an increase of about 25 percent over that approved for 1962-63. The budget allocation for the Fisheries Division (not taking into account the \$143,600 in new positions requested by the Technical Committee) is \$2,224,600 for the biennium 1964-65, or an increase of about 16.5 percent over that approved for the Division during 1962-63.

The FAO Conference also approved the holding during 1964-65 of a number of international meetings, many of interest and importance to the United States fisheries. In the field of fishery biology, the FAO Advisory Committee on Marine Resources Research will hold two meetings during the coming two years, and the Expert Panel for the Facilitation of Tuna Research will hold one meeting. A World Symposium on Fish Culture will also be held during this coming biennium. In the field of fishery technology, the following meetings were approved: A Technical Meeting on Boats Concerning Small Units for Developing Fisheries; a Symposium on the Significance of Fundamental Research in the Successful Utilization of Fish; a Symposium on Improved Fish Handling and Distribution, to be held in conjunction with the forthcoming 11th Session of the Indo-Pacific Fisheries Council; and participation in a joint FAO/CCTA Symposium on the Preservation and Distribution of Freshwater Fish in Africa. In the field of fishery economics and statistics, ap-

proval was given to convening in 1965 a World Meeting on Fishery Administration; holding early in 1964 in Australia a Seminar on Fishery Development Planning and Administration for the Indo-Pacific Region; and holding in 1964 a Meeting on Business Decisions in Fishery Industries.

RESOLUTION ON FISHERIES DEVELOPMENT: THE FAO CONFERENCE:

Realizing that the most pressing need in human nutrition is to make available to people in all parts of the world an adequate supply of high-quality protein such as that derived directly from animals;

Noting that whereas there are great difficulties in rapidly increasing supplies of animal protein in many parts of the world, the oceans and inland waters offer exceptional possibilities for meeting this urgent need;

Observing that world fisheries production has doubled within the past decade and that opportunities exist for comparable increases in the next several decades;

Noting the increased attention which, in recent years, has been given to the rational exploitation of the living resources of the oceans and inland waters by national and international governmental and nongovernmental bodies concerned with research, management, and development;

Emphasizing that wasteful duplication in international fishery work can be avoided only if all efforts are properly coordinated;

Recognizing the constitutional responsibility of FAO in this field, and the increasingly important role that the Fisheries Division should play in the rational use of aquatic resources in order to supply food needed for the world;

Realizing the limited attention which the Fisheries Division has been able to give to this responsibility;

Requests that the Director-General prepare, for consideration by the Council and the 13th Session of the Conference, proposals outlining measures which can be taken to assure that FAO, through its Fisheries Division, has in future years the status of being the leading intergovernmental body in encouraging rational harvesting of food from the oceans and inland waters, bearing in mind the dynamic relationship between the living aquatic resources and the environment and also bearing in mind the importance of fisheries in providing needed animal protein;

Also requests that means for carrying out the proposals which are to be outlined by the Director-General take into account resources not only under the Regular Program budget but also from all other possible sources;

Further requests the Council to consider the status of the Fisheries Division in order to determine how the fisheries activities could be given full recognition in the Organization and among other international bodies that concern themselves with matters related to fisheries.

GREAT LAKES FISHERY COMMISSION

INTERIM MEETING HELD IN OTTAWA:

Continued progress in the joint Canadian-United States attack on the predatory sea lamprey in the Great Lakes was reported at an interim meeting of the Great Lakes Fishery Commission held in Ottawa, Canada, on December 6, 1963. The Commission is an international body formed eight years ago to find means of protecting and, in the case of some species, rehabilitating the commercial fish stocks of the Great Lakes.

International (Contd.):

The sea lamprey, which has played havoc with the once valuable stocks of lake trout and whitefish in many fishing areas of the lakes, is the biggest problem facing the Commission. First priority in the fight against the lamprey was given to Lake Superior, last of the Great Lakes to be invaded by the predator. The lamprey population there was reduced by 80 percent in 1962 through the use of a chemical lampricide, and was kept at about the same level in 1963.



The Commission and its advisers were welcomed by Canada's Deputy Minister of Fisheries of Canada, who said it was gratifying to note that new means of bringing the lamprey under control are being developed. He stated that the research sponsored by the Commission showed promise and had broad value but pointed out that questions regarding long-term economic control of lampreys still remained unanswered.

The meeting, under the chairmanship of Dr. A. L. Pritchard, Director of the Conservation and Development Service of the Department of Fisheries of Canada, heard progress reports from its agents, the U. S. Bureau of Commercial Fisheries and the Fisheries Research Board of Canada, as well as certain state agencies. Other members of the Commission are D. L. McKernan, vice-chairman, who is Director of the U. S. Bureau of Commercial Fisheries; Claude Ver Duin, of Grand Haven, Mich.; Lester Voight, Director of the Wisconsin Conservation Department; Dr. A. O. Blackhurst, Manager of the Ontario Council of Commercial Fisheries, Port Dover, Ont.; and Dr. J. R. Dymond, Consultant to the Ontario Department of Lands and Forests. Representatives of federal, provincial, and state agencies concerned with fisheries management in the Great Lakes and their advisers took part in the discussions.

There are 110 lamprey-producing streams tributary to Lake Superior, 98 of which have been treated with chemicals to kill the young lamprey. The chemical treatments have now been extended to Lake Michigan, and surveys recently completed on Lake Huron have located 90 lamprey-producing streams there. In Lake Michigan, 66 of the 99 lamprey-producing streams have received initial treatment. An interesting development noted at the meeting was the discovery that a molluscicide used to destroy snails in tropical countries could be used to improve the action of the lampricide. Small amounts of that chemical, added to the lampricide now being used, can almost double its effectiveness, and will reduce considerably the cost of treating the remaining Lake Michigan streams, particularly those with high flows.

In addition to reports given on the lamprey control program, the Commission heard reports on the lake trout rehabilitation program from the states of Wisconsin and Minnesota, as well as from the Bureau of Commercial Fisheries and Canada's Fisheries Research Board. In Lake Superior, the improvement in the lake trout population is most pronounced in Wisconsin, where there was a marked increase in the numbers of large fish (over 25 inches) and in the numbers of spawning trout. Hatchery fish planted in Wisconsin waters of that lake were found to have survived well. It was reported that hatchery plantings are expected to be the mainstay of the inshore fishery until natural reproduction reaches its former levels. The survival of large mature fish indicates that this will occur and that the natural population will be rehabilitated. There has also been evidence of improved survival of larger and older trout in Canadian waters in Lake Superior, and the over-all improvement appears to be continuing.

The Commission and its advisers also discussed the yellow pike (walleye) situation in Lake Erie. After several years of high production in the mid-1950's, the yellow pike population in that lake has declined drastically, although some recent recovery is in evidence for certain year classes. A program is under way to find the causes of the changes in abundance of that species and the means of improving the fishery.

At the December 6 meeting, the Commission received for study, proposed programs of investigations of the Great Lakes fisheries prepared by both Canadian and United States

International (Contd.):

fishery scientists concerned with fishing in the Great Lakes.

Note: See Commercial Fisheries Review, January 1963 p. 71.

INTERNATIONAL PACIFIC HALIBUT COMMISSION**NORTH PACIFIC HALIBUT FISHING
ENDED NOVEMBER 30, 1963:**

The 1963 North Pacific halibut fishing season was marked by the failure of fishermen to fulfill catch quotas in both Area 2 and in the newly created Area 3B North Triangle.

Areas 1 and 2 in the North Pacific were closed to halibut fishing at 6 p.m. (P.S.T.), November 30, 1963, in accordance with regulations of the International Pacific Halibut Commission. At that time, the catch limit of 28 million pounds in Area 2 had not been attained; no catch limit was provided for Area 1. On October 17, 1963, the Commission announced that a total of 2.4 million pounds of halibut was still needed for attainment of the quota in Area 2. After that announcement, the halibut fleet discarded the 8-day lay-over period.

Areas 3B North and 3B South (without catch limits) were closed on October 15, 1963. Area 3B North Triangle with a catch limit of 11 million pounds was also closed on October 15, 1963. Although landings from that new area were still slightly below the quota, the total catch was 10,944,000 pounds, of which Canadian fishermen took 4,058,000 pounds, Japanese fishermen took 3,670,000 pounds, and United States fishermen took 3,216,000 pounds. Area 3A was closed on August 9, 1963, with attainment of the catch limit of 34 million pounds.

In 1963, Areas 3B North and 3B North Triangle were opened to halibut fishing on March 25, Area 3B South was opened on April 19, and Areas 1, 2, and 3A were opened on May 9.

The failure of fishermen to attain the catch limit in Area 2 resulted in an extremely long fishing season. In 1963, Area 2 was open to halibut fishing for 205 days, as compared to 122 days in 1962, 120 days in 1961, 91 days in 1960, 68 days in 1959, 59 days in 1958, 47 days in 1957, and 38 days in 1956. Halibut seasons in Area 2 were even shorter before the adoption in 1956 of the "lay-over" pro-

vision requiring fishing vessels to remain in port for a specified rest period after each trip. The fishing season in Area 2 was only 24 days in 1955, 21 days in 1954, and 24 days in 1953.

Preliminary data indicate that the United States and Canadian catch of halibut in the North Pacific in 1963 totaled 70.6 million pounds--33.8 million pounds or 48 percent of that total caught by United States fishermen and the balance of 36.8 million pounds or 52 percent of that total by Canadian fishermen. Not included in the total is almost 3.7 million pounds of halibut caught by Japanese fishermen in Area 3B North Triangle. Canadian fishermen in 1963, for the first time since the fishery has been under international control, caught over 50 percent of the total United States-Canadian landings. Since 1936 the Canadian share of the landings has been steadily increasing while the United States share has been declining.

Note: See Commercial Fisheries Review, Sept. 1963 p. 56, Aug. 1963 p. 70, and March 1963 p. 41.

NORTH PACIFIC FISHERIES COMMISSION**STATEMENT BY U. S. DELEGATION
CHAIRMAN AT SEPTEMBER
CONFERENCE IN TOKYO:**

The second Meeting of the Parties (Canada, Japan, United States) to the International Convention for the High Seas Fisheries of the North Pacific Ocean to consider a revision of the Convention began on September 16, 1963, and came to a close on October 7, 1963. At the closing session, Benjamin A. Smith II, Chairman of the United States Delegation, made this statement:

"We have just concluded 3 weeks of intensive discussions with delegations of Canada and Japan on the future of fisheries treaty arrangements in the North Pacific. The three nations did not reach complete agreement in these talks. In view of the wide differences which remained at the end of the first round of discussions at Washington in June 1963, it would perhaps have been unrealistic to have expected complete agreement at this time.

"Nevertheless, considerable progress has been made in narrowing the differences of view. The delegations are recommending to their respective Governments that a further conference be held next spring, probably at Ottawa. I personally look forward with considerable hope to a resumption of these talks

International (Contd.):

and to the prospect of an eventual reconciliation of views among the three nations.

"As President Kennedy stated on September 10, 1963, shortly before my departure for Japan, the United States believes that the abstention principle is sound and reasonable and that without restraints of this nature the nations of the world would run serious risks of depleting fisheries. This was our position at the meeting in Tokyo. At the same time we recognized that certain difficulties had arisen with respect to the present formulation of the principle and to the language of the present treaty. For example, the Japanese people have come to interpret the treaty as an unfair arrangement imposed upon them during the period of military occupation.

"With this in mind, we submitted at the Tokyo conference a new draft treaty. This new draft involves no compromise of the principles on which we stand but does, in my view, constitute a major effort toward enabling the Japanese to accept our position.

"The United States proposal was not completely acceptable to Japan. However, Japan was willing to recognize the special interest of the United States in the salmon and halibut stocks of the eastern North Pacific and on the basis of this recognition was prepared to continue to accept substantial restrictions on its fishing in this area. This constituted a major departure from the rigid position which Japan took at the Washington talks.

"I believe that the discussions have lessened the prospects of a break in the existing relationships in the field of fisheries and that, with further patient consideration of the requirements of each country, the three nations will ultimately reach agreement." (The Department of State Bulletin, November 4, 1963.)

NORWEGIAN-SOVIET SEAL COMMISSION

SIXTH SESSION HELD IN OSLO:

The sixth session of the Norwegian-Soviet Seal Commission met in Oslo November 28-30, 1963, to consider the conservation of seal stocks in the northeastern Atlantic. The Commission, which was presided over by the leader of the Norwegian delegation, was presented with reports on the 1963 seal catch by both Norway and the Soviet Union. The Com-

mission agreed to extend scientific investigations aimed at protecting seal stocks in the northeastern Atlantic and providing for a rational exploitation of seal herds in the area. The seventh session of the Commission will be held in Moscow, either at the end of 1964 or in early 1965. (United States Embassy, Oslo, December 7, 1963.)

OCEANOGRAPHY

INTERNATIONAL INVESTIGATION OF JAPANESE "BLACK CURRENT" PLANNED:

An international working conference of oceanographers and biologists (Kuroshio Investigation Planning Meeting) met in Tokyo October 29-31, 1963. The Hawaii Area Director of the U. S. Bureau of Commercial Fisheries served as a Member of the United States Delegation, Representative of the Indo-Pacific Fisheries Council, and Rapporteur of the sessions. According to the Area Director, the meetings convened at the Japanese Ministry of Foreign Affairs, for presenting plans and background information for a long-term, multination program of research on the Kuroshio, Japan's famed "Black Current."

The idea of an international cooperative survey of the major "ocean river" of the western Pacific was put forward in a resolution of the International Oceanographic Committee in late 1962, and the Tokyo meeting, held under the auspices of United Nations Educational, Scientific, and Cultural Organization (UNESCO), the Government of Japan and several Japanese scientific organizations, was the first step in implementation of that resolution. The recommendations of the planning meeting will be reported back to the International Oceanographic Committee for its guidance in setting up detailed plans for the oceanographic investigations.

The Kuroshio is one of the main arteries in the circulation of the Pacific Ocean. It moves warm water from the Equator northward past Formosa and Japan and thence eastward across to the American coast, performing functions similar to those of the Gulf Stream in the Atlantic. It deeply affects the climates of northeastern Asia and northwestern America and helps to create, where it mingles with cold Arctic waters, some of the richest fishing grounds in the world. For these reasons its cycles of flow are of concern to many countries, a fact that was evidenced in the attendance of representatives of China, Hong Kong, Japan, Korea, the Philip-

International (Contd.):

pires, the United States, the Soviet Union, and Viet Nam at the Tokyo conference. The meeting was presided over by Japanese meteorologist Kiyoo Wadati, assisted by Claro Martin of the Philippines as vice-chairman.

The consensus of the meeting was that the Kuroshio investigations should cover an area from the Equator to 43 degrees north (roughly the latitude of Hokkaido) and from 160 degrees east longitude to the shores of Asia. Multiship research cruises would be carried out in summer and winter of 1965 and 1966. The results would then be reviewed and plans made for continuing studies of the oceanography and fisheries of the area. It is expected that Japan and the Soviet Union will assign a number of large ocean research ships to the survey. The United States is not yet committed to active participation in the study, although United States marine scientists are interested in the area and the scientific problems which it presents.



Aden

NEW FISHERIES RESEARCH VESSEL:

A new 67-foot fisheries research vessel for the Department of Fisheries, Federation of South Arabia, is under construction in Scotland and scheduled for delivery in mid-1964. The new all-steel vessel, planned for extended operations in the Indian Ocean and the Red Sea, will have a purse-seine design with accommodation and navigating space forward, leaving a large, and open deck aft. Other specifications are beam 19 feet and draft $10\frac{1}{2}$ feet. A 320 horsepower Diesel engine will drive the vessel at 10 knots. It will have a refrigerated hold with a capacity of 35 metric tons.

The new vessel will have navigational and fish-finding equipment such as radar, echosounder, and radiotelephone. The electronic equipment should open up waters previously inaccessible to the Federation's two smaller vessels, the Gulf Explorer and the Federal Star. It will be possible to track and plot the movements of fish both near the surface and at depths up to 500 fathoms.

Fishing gear on the vessel will include a large purse-seine net and a special line haul-

er constructed to handle Japanese-type long-lines. The vessel will also be fitted for pole-and-line fishing for tuna with live bait.

The cost of the new vessel is being shared by Aden State and the Federation of South Arabia because it is expected to benefit both.

This is the third vessel commissioned by the Federation of South Arabia Fisheries Department in the last 16 years. The other two, both of which will remain in service, have served as both survey and training vessels. Their activities in the Indian Ocean and the Red Sea have added to knowledge of the fisheries potential in those areas, which are now attracting considerable fishing interest. (United States Consulate, Aden, December 14, 1963.)

Note: See Commercial Fisheries Review, May 1963 p. 56.



Argentina

FISH MEAL PRODUCTION ESTIMATES REVISED:

Predictions made in October 1963 as to Argentina's fish-meal production were considerably overoptimistic. Total production for 1963 is expected to be about 6,800 metric tons, rather than the 20,000 tons previously forecast. This revised estimate is based upon data from the Argentine Bureau of Fisheries for the first nine months of 1963. Production in that period amounted to 4,838 tons--3,947 tons from the ocean catch and 891 tons from the fresh-water catch.

The largest of Argentina's 5 major fish-meal plants began production in March 1963. The new plant is located in Mar del Plata and was originally intended for installation in Deseado in the Patagonian province of Comodoro Rivadavia. Its daily capacity is about 20 tons of fish meal, surpassing the 13-ton capacity of another plant in Mar del Plata, which began operations early in 1961. There are 3 other modern fish-meal plants processing ocean fish at Mar del Plata.

As of late 1963, the annual capacity of the industry producing fish meal from the ocean catch was about 9,600 metric tons. The capacity of the industry that processes fresh-water fish is about 2,400 tons to make an annual capacity of 12,000 metric tons. Two or three firms are seriously considering new

Argentina (Contd.):

plants for processing ocean fish, but whether these projects will be sufficiently advanced to come into production during 1964 is uncertain.

The growth of the Argentine fish-meal industry, however, is expected to continue, financed primarily by the earnings of the local fishing industry. While the uncertainty of business conditions in Argentina may have an immediate inhibiting effect on expansion, trade sources believe that the pace of development will depend primarily on the world market for fish meal, and the complementary growth of markets for Argentine fish. The 1963 landings are running 20 percent above the level of the previous year, and 1963 is certain to be a record year (estimated at 120,000-130,000 tons) for the Argentine fishing industry. (United States Embassy, Buenos Aires, November 30, 1963.)



Brazil

SPINY LOBSTER LANDINGS AND EXPORT TRENDS:

In 1962, exports by the steadily growing Brazilian spiny lobster industry were up 18.8 percent from 1961 and 73.1 percent from 1960, according to data supplied by the Brazilian Government. (Most of those exports are shipped to the United States in the form of frozen products.)

Brazilian spiny lobster production amounted to 3,048 metric tons in 1961, compared to 2,944 tons in 1960; 1,015 tons in 1959; and 1,100 tons in 1958.

The Superintendencia do Desenvolvimento da Pesca (SUDEPE) was recently established as a governmental coordinating agency for national fisheries development in

the form of vessels, equipment, techniques, and possibly the services of United States fishermen, although not limited to such categories. (United States Embassy, Rio de Janeiro, November 22, 1963.)



Canada

SALMON TAGGING PROGRAM IN THE STRAIT OF GEORGIA:

In early December 1963, biologists of the Canadian Department of Fisheries began a 6-week coho and chinook salmon tagging program in the Strait of Georgia area using the commercial purse-seine vessel *Naughty Lady*. This program represents the second phase of a field study initiated in May 1963, aimed at providing information on the factors governing the coho and chinook salmon production of the area. The tagging study is being conducted to measure, specifically, the movement and exploitation of resident coho and chinook salmon grilse within and away from the Strait of Georgia area.

Tag returns from the first phase of this project were very satisfactory largely because of the excellent cooperation of both sport and commercial fishermen. The success of the current tagging program will also be dependent on the degree of tag recovery obtained, and cooperation is again requested in returning tags to the Canadian Department of Fisheries, 1155 Robson Street West, Vancouver 5, B.C., together with the date, method, and location of recovery.

A nominal reward of 50 cents for each tag is offered. Special postage prepaid tag return envelopes are available at most boat rent-

Brazilian Exports of Spiny Lobsters, by Ports, 1958-1962

Ports	1962		1961		1960		1959		1958	
	Metric Tons	US\$ 1,000	Metric Tons	US\$ 1,000	Metric Tons	US\$ 1,000	Metric Tons	US\$ 1,000	Metric Tons	US\$ 1,000
Fortaleza	1,382	2,708	1,266	2,070	711	1,041	390	430	239	264
Recife	688	1,331	475	793	485	775	226	252	191	209
Santos	-	-	-	-	-	-	-	-	3	3
Total	2,070	4,039	1,741	2,863	1,196	1,816	616	682	433	476

Brazil. The Chief of the Technical Staff of SUDEPE has stated that there are good opportunities for United States investment in the Brazilian spiny lobster industry; however, he stressed that such investment would have to collaborate with Brazilian capital. United States investment, he suggested, might be particularly attractive in

al and boat moorage facilities and fish camps in the area. Tags may also be returned to any Fishery Officer. (Canadian Department of Fisheries, Vancouver, November 29, 1963.)



Congo Republic

FRESHWATER FISHERIES PRODUCTION DROPS SHARPLY:

In 1959, the Kivu area of the Congo Republic produced about 37,000 tons of fish from Lakes Tanganyika, Kivu, and Edward, including fish caught by traditional as well as by modern methods. Since that time, the catch has been reduced to a small fraction of the 1959 total, and retail prices have risen to a point where only the most well-to-do citizens can afford to eat fish. Causes of this drop in production are the lack of nets, vessels, and organization. For the modern section of the industry, technicians and nets are needed, as well as some way of getting the vessels and the refrigeration plant back into operation. Solution of those problems could result in a catch of 40,000 tons a year, which would be of considerable value to the Kivu area economy. In addition, the area could not only supply a part of the fish needs of the rest of the Congo, but could also export fish. (United States Consulate, Bukavu, November 6, 1963.)



German Federal Republic

NEW RESEARCH VESSEL "METEOR II":

The new research vessel *Meteor II* was launched in Germany during August 1963 under the joint ownership of the German Hydrographic Institute of Hamburg and the German Research Association of Bad Godesbert.

The *Meteor II* is a 265-foot, Diesel-electric vessel displacing 2,200 tons. Its main engine gives a speed of 14 knots on a single screw, but it also has both an active rudder and a bow propulsion unit, giving extreme maneuverability. Active antirolling tanks were also fitted. The vessel will carry a total complement of 57, including 24 persons in the scientific party. (National Oceanographic Data Center, *Newsletter*, October 31, 1963.)



Ghana

FISHERIES TRENDS, THIRD QUARTER 1963:

Programs by Ghana to expand the production of fish, principally by the purchase of large modern fishing craft, received particular attention during the third quarter of 1963. The Government signed an agreement on July 9 with a Norwegian shipbuilding group for the delivery of six fishing trawlers. A £G5.7 million (US\$15,960,000) contract was also signed with a large Japanese shipbuilding company for the construction of 10 stern trawlers and 2 carriers. All of the vessels are to be used by the Government-owned fishing corporation and deliveries are scheduled to start in mid-1964.

The Government fishing corporation took delivery in early August 1963 of two British-built stern trawler fishing vessels. Those vessels were the first to be delivered to the corporation, which left a total of 36 fishing vessels still on order--18 stern trawlers (6 from Norway, 10 from Japan plus 2 carriers), 8 side trawlers (Soviet Union), and 10 purse seiners (Soviet Union).

A private Ghanaian fishing company has on order 4 fishing trawlers from Japan and Yugoslavia. The 2 Japanese trawlers were to cost £G180,000 (\$504,000) each; the 2 smaller Yugoslavian vessels £G42,000 (\$117,600).

The Ministry of Agriculture has announced plans to increase the production of fish through the development of fisheries in the Volta River and its tributaries. Particular emphasis was to be placed on the development opportunities which would be provided by the creation of the 3,200-square mile Volta Lake after completion of the Akosombo Dam. (United States Embassy, Accra, December 1, 1963.)

FISHERY IMPORTS PLACED UNDER THE CONTROL OF STATE CORPORATIONS:

The Ghanaian Minister of Trade announced on November 28, 1963, that, effective immediately, all imports of fresh and frozen fish would be handled by the Government-owned Ghana Fishing Corporation. All licenses issued to private firms for the importation of fish and for the charter of foreign fishing vessels were withdrawn. Affected firms, however, were permitted to continue to operate their own vessels. The Minister indicated

Ghana (Contd.):

that the new regulations were designed to permit the Ghana Fishing Corporation to exercise complete control over the supply and price of fresh and frozen fish.

The announcement followed a similar declaration on November 13, 1963, that, effective January 1, 1964, the Government-owned Ghana National Trading Corporation would be the sole importer of a number of essential commodities including canned fish. (United States Embassy, Accra, December 1, 1963.)



Greece

FISHERIES TRENDS,
JANUARY-SEPTEMBER 1963:

Greek freezer and refrigerated trawlers operating in the Atlantic delivered 14,352 metric tons of frozen fish during January-September 1963, compared with landings of 11,888 tons during the same period of 1962 and 10,131 tons in the first 9 months of 1961. Contributing to the increased production in January-September 1963 was the expansion of the fleet of large freezer trawlers to 19 vessels; 2 more freezer trawlers were to be added in late 1963 and 6 were scheduled for delivery in 1964. The new vessels could raise the annual productive capacity of the Greek Atlantic fleet to 30,000 tons of frozen fish in 1964. Because of the increased catch, Greek operators are seeking a curtailment of fishery imports:

Greece sponge fishing in Greek, Egyptian, and Libyan waters through 1963 was expected to yield about 20 percent more than the 1962 production of 71 tons. Some Greek divers switched to aqualung devices in 1963 following the Greek Government's approval of SCUBA diving equipment.

Favorable conditions exist for the development of a Greek pearl culture industry, according to a Japanese report issued in October 1963. (Alieia, October 1963, and United States Embassy, Athens, November 22, 1963.)

Note: See Commercial Fisheries Review, December 1963 p. 63.



Iceland

ICELANDIC FISHERY LANDINGS BY
PRINCIPAL SPECIES, JANUARY-JULY 1963:

Species	January-July	
	1963	1962
 (Metric Tons)	
Cod	203,157	196,595
Haddock	30,007	23,762
Saithe	8,270	8,305
Ling	4,149	5,491
Wolfish (catfish)	11,921	12,035
Cusk	4,826	4,052
Ocean perch	19,648	3,636
Halibut	695	892
Herring	196,026	244,231
Shrimp	349	349
Capelin	1,077	-
Other	7,537	6,865
Total	487,662	506,213

Note: Converted to whole ungutted fish regardless of how landed.

ICELAND'S UTILIZATION OF FISHERY
LANDINGS, JANUARY-JULY 1963:

How Utilized	January-July	
	1963	1962
 (Metric Tons)	
Herring ^{1/} for:		
Oil and meal	126,696	183,516
Freezing	20,605	16,104
Salting	43,982	36,603
Fresh on ice	5,617	7,718
Groundfish ^{2/} for:		
Fresh on ice	19,139	16,331
Freezing and filleting	125,304	113,844
Salting	65,793	81,492
Stockfish (dried unsalted)	65,971	38,830
Canning	237	289
Home consumption	8,610	7,726
Oil and meal	2,290	1,722
Shellfish for:		
Fresh on ice	2	-
Freezing	3,334	1,952
Canning	82	86
Total production	487,662	506,213

^{1/}Whole fish.

^{2/}Drawn fish.

Source: Statistical Bulletin, vol. 32, no. 4, November 1963, The Statistical Bureau of Iceland, Reykjavik, Iceland.

EXPORTS OF FISHERY PRODUCTS,
JANUARY-SEPTEMBER 1963:

During January-September 1963, there was a considerable increase in exports of frozen herring, herring meal, and cod-liver oil as compared with the same period in 1962, according to the Statistical Bureau of Iceland's Statistical Bulletin, November 1963. Exports of fish meal and uncured salted fish showed a considerable decrease in the first 9 months of 1963 (see table).

Iceland (Contd.):

Icelandic Fishery Exports, January-September 1963 with Comparisons						
Product	Jan.-Sept. 1963			Jan.-Sept. 1962		
	Qty.	Value f.o.b.		Qty.	Value f.o.b.	
	Metric Tons	1,000 kr.	US\$ 1,000	Metric Tons	1,000 kr.	US\$ 1,000
Salted fish, dried	1,579	32,065	744	1,938	38,111	884
Salted fish, uncured	17,569	221,266	5,133	23,892	287,720	6,675
Salted fish fillets	969	12,291	285	1,090	14,878	345
Wings, salted	1,504	18,484	429	983	11,271	261
Stockfish	5,202	146,323	3,395	6,550	167,751	3,892
Herring on ice	7,224	23,417	543	4,899	17,144	398
Other fish on ice	22,960	121,199	2,812	17,045	84,915	1,970
Herring, frozen	26,159	144,498	3,352	17,076	93,552	2,170
Other frozen fish, whole	2,265	24,133	560	1,134	15,344	356
Frozen fish fillets	41,535	767,720	17,811	40,322	703,639	16,324
Shrimp and lobster, frozen . .	438	44,495	1,032	328	32,591	756
Roes, frozen	788	13,227	307	648	12,401	288
Canned fish	174	9,036	210	222	11,235	261
Cod-liver oil	7,175	52,337	1,212	3,751	30,459	707
Lumpfish roes, salted	324	5,322	123	401	6,156	143
Other roes for food, salted . .	3,176	44,919	1,042	2,745	37,922	880
Roes for bait, salted	1,745	12,571	292	1,387	8,678	201
Herring, salted	29,098	295,780	6,862	26,685	256,601	5,953
Herring oil	29,981	139,055	3,226	33,294	141,245	3,277
Ocean perch oil	754	5,130	119	15	59	1
Whale oil	3,298	23,093	536	1,152	9,104	211
Fish meal	11,535	64,317	1,492	19,334	121,130	2,810
Herring meal	44,608	266,186	6,176	37,230	243,555	5,650
Ocean perch meal	2,953	13,754	319	34	204	5
Wastes of fish, frozen	4,452	12,426	288	4,544	11,457	266
Liver meal	371	2,563	59	305	2,029	47
Lobster and shrimp meal . . .	72	193	4	13	42	1
Whale meal	100	558	13	402	2,151	50
Whale meat, frozen	1,967	13,564	315	1,621	12,284	285

Note: Values converted at rate of 1 krona equals 2.32 U. S. cents.



Ireland

NEW FISHING COMPANY AIDED BY JAPANESE AND FRENCH INTERESTS:

Irish, Japanese, and French interests have combined to form a new offshore fishing company. The company will be based in Ireland, but fish will be landed for export only. The major shareholder in the new company, which was registered in Dublin early in December 1963, is a large Japanese fishing company. The French interest comes from the important fishing center of Lorient in Brittany.

It is expected that the new company will operate 6 deep-sea vessels, built to the most modern design, and each costing about £750,000 (US\$2.1 million).

It is possible that three of the vessels may be built at a shipyard in Cork. Each vessel would employ about 100 men.

The vessels will fish in the North Atlantic and none of the catch will be marketed in Ireland. The bulk of the catch is expected to be packaged on board and delivered directly to British and other European markets. The balance will be landed at an Irish port and processed for export. The new company expects a gross return of about £3 million (\$8.4 million) a year from its operations.

Ireland (Contd.):

No definite decision has yet been made on the choice of a base port but Galway, where harbor facilities are good and a fish-processing factory is close at hand, might be a likely choice. (*Irish Press*, December 12, 1963.)



Italy

1963 QUOTA FOR FRESH AND FROZEN TUNA IMPORTS INCREASED:

The Italian Government on October 31, 1963 (*Gazzetta Ufficiale* No. 316, December 5, 1963), increased the import quota for fresh and frozen tuna by 8,000 metric tons for the last two months of 1963. The quota, which is duty-free, was opened to all countries. (United States Embassy, Rome, December 14, 1963.)



Japan

VALUE OF FROZEN AND CANNED TUNA EXPORTS, JANUARY-SEPTEMBER 1963:

Japan's exports of frozen tuna to the United States in the first 9 months of 1963 were down 45.7 percent in value as compared with the same period in 1962. For the same period the export value of canned tuna increased 4.0 percent.

Value of Japan's Exports of Selected Fishery Products, January-September 1962-63						
Product	Jan.-Sept. 1963			Jan.-Sept. 1962		
	U.S.	Total	U.S. Ratio	U.S.	Total	U.S. Ratio
	(In US\$1,000)		%	(In US\$1,000)		%
Tuna, frozen . .	13,900	33,384	41.6	25,603	40,500	63.2
Tuna, canned . .	10,763	16,702	64.4	10,652	15,341	69.4

Note: Exports are valued f.o.b. Japan.

Source: Customs Bureau, Japanese Ministry of Finance.

The United States took 41.6 percent of Japan's total frozen tuna exports during the first nine months of 1963 as compared with 63.2 percent in the same period of 1962. The United States ratio of Japan's total canned tuna exports was 64.4 percent as against the same period in 1962 when it was 69.4 percent. (United States Embassy, Tokyo, November 1963.)

CANNED TUNA SALE TO THE UNITED STATES:

The Tuna Standing Committee of the Japan Canned Foods Exporters Association decided that the first canned tuna sale to the

United States in the business year which began December 1, 1963, should consist of 100,000 cases. Since this quantity is exactly half that which the Canned Tuna Packers Association approved for release for the first sale, the two organizations expected to meet to resolve their differences. (*Suisan Keizai Shimbun*, December 15, 1963.)

NEW TYPE CANNED TUNA PRODUCT DEVELOPED:

A new canned tuna product--"tuna steak"--has been developed by a Japanese fishing company. Seasoned with soy sauce and cooked in vegetable oil, the product is said to be very tender and meaty in taste, unlike the usual tuna pack in which some fish odor is generally present. The "tuna steak," which is packed in 160-gram (5.6-oz.) cans, was placed on sale on the Japanese domestic market on December 1, 1963, and retailed at 60 yen (17 U. S. cents) per can.

The Japanese firm is reported to be experimenting with other cooking and seasoning methods for the manufacture of specialty packs suitable for export to foreign countries. (*Suisan Tsushin*, December 2, 1963.)

FROZEN TUNA EXPORT MARKET IN EARLY DECEMBER 1963:

The Japanese frozen tuna export market, which had been described as favorable early in December 1963, had turned sluggish due to few tuna vessel arrivals in Japan and resultant high ex-vessel prices. The market quotation for frozen gilled-and-gutted yellowfin for export to the United States from Japan proper was US\$375 a short ton c.&f. However, the ex-vessel price of yellowfin when converted to the c.&f. export price reportedly is equal to US\$390 a short ton. This situation has resulted in very few export contracts being concluded with United States tuna buyers, according to reports.

On the other hand, the European frozen tuna import market is reported to be firm. Japanese frozen gilled-and-gutted yellowfin exported to Italy were reported to have brought US\$400-410 a metric ton c.&f. Frozen gilled-and-gutted big-eyed tuna were said to be selling for US\$325-330 a metric ton c.&f., and mixed shipments of big-eyed

Japan (Contd.):

and yellowfin tuna (with a preponderance of big-eyed) sold for \$340 a metric ton.

Reportedly, yellowfin tuna made up about 30 percent of the total catch of tuna in the Atlantic Ocean for the first 11 months of 1963. (Suisancho Nippo, December 7, 1963.)

ALBACORE TUNA EX-VESSEL PRICE TRENDS, NOVEMBER-DECEMBER 1963:

The Japanese ex-vessel price for albacore tuna increased sharply in the latter part of 1963. In late November, the ex-vessel price of albacore at Kesennuma ranged between 90-120 yen a kilogram (US\$227-302 a short ton), with a high of 136 yen a kilogram (\$343 per short ton) reported on November 30. On December 6, the ex-vessel price of albacore at Kesennuma was reported as 115-159 yen a kilogram (\$290-401 per short ton), and at Shimizu 165-185 yen a kilogram (\$416-467 per short ton). However, on the same day, about 16 short tons of frozen albacore landed at Yaizu sold at ex-vessel prices of 70-130 yen a kilogram (\$176-328 per short ton). A day earlier, on December 5, the ex-vessel price of frozen albacore at Yaizu ranged from 100-165 yen a kilogram (\$252-416 a short ton).

During the following week (December 14), 1,650 pieces of albacore landed at Kesennuma brought from 120-160 yen a kilogram (\$302-403 a short ton); and at Miyako, an undetermined quantity of albacore landed on the same day sold for 146-158 yen a kilogram (\$368-398 a short ton). On December 10 at Shimizu, 390 pieces of albacore brought ex-vessel prices of 110-160 yen a kilogram (\$277-403 a short ton). (Suisan Keizai Shim-bun, December 6, 7, 11, and 15, 1963, and other periodicals.)

FROZEN TUNA EXPORT MARKET TRENDS, MID-DECEMBER 1963:

The Japanese export frozen tuna market as a whole was considered dull in mid-December 1963, with few export agreements concluded with United States tuna buyers. However, one large United States packer was reported seeking frozen gilled-and-gutted yellowfin tuna in Japan and offering US\$10 a short ton above the existing Japanese f.o.b.

export price of \$325 a short ton. The same firm was also said to be offering nearly \$30 a short ton above the prevailing export market price for tuna loins. Reportedly, the United States firm planned to ship tuna purchased in Japan to its Puerto Rico plant on a chartered freighter in late December. (Suisan Tsushin, December 16, 1963, and other sources.)

NEW FROZEN TUNA EXPORT REGULATIONS PLANNED:

The Japan Export Frozen Tuna Producers Association met December 12, 1963, and appointed chairmen of those committees which are expected to meet early in 1964 to begin drafting tuna export regulations for fiscal year 1964 (April 1964-March 1965). The committees involved are the Direct Export Committee, the Atlantic Ocean and Indian Ocean Committees, and the Tuna Loin Committee.

The chairman of the Producers Association has been delegated the responsibility of appointing a committee to study the problem involving the landing of frozen tuna at overseas tuna bases, such as American Samoa. Under current regulations, Japanese vessel owners operating vessels out of certain overseas tuna bases can only operate "ice" boats and must land their catches in fresh form. (Suisan Tsushin, December 14, 1963.)

DENMARK CONTRACTS TO IMPORT FROZEN TUNA:

Denmark is reported to have contracted to purchase 250 metric tons of Atlantic Ocean-caught frozen tuna (160 tons of bluefin and 90 tons of big-eyed) from Japan. The sale, negotiated by a Japanese trading company, reportedly was contracted at export prices of US\$425 per metric ton for gilled-and-gutted bluefin and \$365 per metric ton for gilled-and-gutted big-eyed, both prices c.i.f. Esbjerg and Skagen, Denmark. Shipment was expected to be made by the end of 1963.

This is believed to be the first time that Japanese frozen tuna have been exported to Denmark, which normally purchases bluefin tuna from Norway. Norway had a poor bluefin season in 1963 and was unable to supply Denmark's demand, hence the special pur-

Japan (Contd.):

chase from Japan. (Suisan Tsushin, December 7, 1963.)

TUNA FISHING TRENDS IN EQUATORIAL PACIFIC, NOVEMBER 1963:

An examination of catch statistics as of November 30, 1963, reveals that Japanese tuna vessels fishing the vast equatorial waters of the Pacific Ocean (from the vicinity of Samoa to the waters off the Philippine Islands and off Borneo) averaged about one metric ton of tuna per day per trip. Very few vessels caught over two tons per day. Due to extremely poor fishing during the first 11 months of 1963 in the equatorial Pacific Ocean, many vessels in December 1963 reportedly moved to the fishing grounds south-east of Australia, where they were catching an average of 1.5 metric tons a day, as compared to an average of 3-4 tons a day in 1962. Also, many Japanese tuna vessels were reported to have moved to the tuna grounds in the eastern South Pacific. Those vessels were said to be averaging 2.5-3 tons per day. (Suisancho Nippo, December 9, 1963.)

TUNA TRANSSHIPMENT OPERATIONS AT DURBAN, SOUTH AFRICA:

A large Japanese fishing company has established a 5,000-ton transshipment target in 1964 for its base in Durban, South Africa. To meet the target, the firm is actively encouraging Japanese tuna vessel owners, operating vessels in the Indian Ocean, to deliver their catches in 1964 to Durban. At least 7 tuna vessels delivered their catches to Durban in late 1963. The Japanese firm's 1963 operation at Durban (started in June 1963) was reported to be less than successful.

For the period June-November 1963, transshipments^{1/} of frozen tuna to Japan proper from Durban totaled: 739 metric tons of round albacore; 373 tons of gilled-and-gutted yellowfin; 74 tons of yellowfin fillets; 10 tons of round big-eyed; 138 tons of big-eyed fillets; 116 tons of dressed spearfish; 60 tons of spearfish fillets; and 75 tons of shark. (Suisancho Nippo, December 13, 1963.)

^{1/}Transshipments to the United States not permitted.

NEW LONG-LINE GEAR TESTED OFF WEST AFRICAN COAST:

A Japanese fishing company has dispatched the 350-ton tuna-fishing vessel Koyo Maru to the Atlantic Ocean to explore the waters off Angola, Congo, and South-West Africa. Reportedly, the vessel will test a new type of gear described as "vertical long-line" designed to fish tuna and other fish of that type at different depths simultaneously. (Suisan Tsushin, December 11, 1963.)

FISHING VESSEL CONSTRUCTION PERMITS, LATE 1963:

On December 7, 1963, the Japanese Fisheries Agency issued permits for the construction of 84 fishing vessels, including 47 tuna vessels. Of the tuna vessels, 42 were vessels of the 39-ton class. In November 1963, the Agency authorized the construction of 140 39-ton vessels. (Suisan Keizai Shimbun, December 15, 1963, and other sources.)

FISHING VESSEL CONSTRUCTION PERMITS, NOVEMBER 1963:

During the month of November 1963, the Japanese Fisheries Agency issued permits for the construction of 240 fishing vessels. Of these, 140 were permits for the construction of 39-ton tuna vessels, for which fishing licenses were not required in 1963 but will be required in 1964. In addition, the Agency issued permits for the construction of 18 tuna vessels ranging in size between 70-300 tons gross (mostly over 200 tons), two 19-ton portable tuna-fishing boats, and two 3,430-ton distant-water trawlers. The trawlers are expected to be assigned for operation in the Bering Sea. (Suisan Keizai Shimbun, November 7, 17, & 29, 1963; and other sources.)

GOVERNMENT STOPS APPLICATIONS FOR PERMITS TO CONSTRUCT SMALL TUNA VESSELS:

Effective December 7, 1963, the Japanese Fisheries Agency stopped accepting applications for permits to construct 39-ton tuna fishing vessels by publishing in the Government Gazette the ministerial ordinance relating to the establishment and requirements of the newly designated "coastal (offshore) tuna fishery" (north of 10° N. lat. and west of 160° E. long.). Under this ordinance, tuna vessels in

Japan (Contd.):

the 20- to 39-ton size classification, which heretofore operated freely without fishing licenses, will henceforth be brought under a licensing system. At the same time, the operation of tuna vessels in the 20- to 50-ton size category will be restricted to the "off-shore tuna fishery."

The Fisheries Agency had been flooded in October and November 1963 with applications for permits to construct 39-ton tuna vessels when it became apparent that the Government intended to regulate the operation of this class of vessels. Reportedly, to control the flow of applications for licenses to operate tuna vessels in the newly designated fishery, including application for permits to construct new 39-ton vessels, the Agency published the ministerial ordinance somewhat earlier than generally anticipated.

The number of tuna vessels in the 20- to 50-ton size classification to be licensed for operation in the newly established "offshore tuna fishery" was scheduled for governmental decision in January 1964. Reportedly, the Agency intends to restrict the number of operational vessels to about 1,200 vessels, although it is estimated that the Agency, as of December 7, was in receipt of over 2,000 applications to operate tuna vessels in the "offshore tuna fishery." (Suisan Tsushin, December 9, 1963.)

LICENSES APPROVED FOR DISTANT-WATER TRAWLERS:

The Japanese Fisheries Agency on November 28, 1963, met with the Central Fisheries Coordination Council (highest government-industry advisory group on fisheries) to review applications for distant-water trawl licenses filed before the October 18 deadline by Japanese fishing companies. At that meeting, the Fisheries Agency approved the Council's recommendation that the government license a total of 18 vessels for distant-water trawl operation and also adopted the Council's proposed licensing requirements for those vessels.

Licensing requirements and number of trawlers approved for distant-water operation are:

(1) The two Japanese fishing companies currently operating over 10 trawlers in the Atlantic Ocean shall not be granted licenses to operate additional trawlers in that ocean.

(2) Regardless of the number of applications submitted by the fishing companies, not more than one trawler license shall be issued to any company for each area of operation.

The 13 vessels newly licensed for operation in the Atlantic Ocean (off Africa) are 6 vessels of 299 gross tons; 1 vessel of 500 tons; 1 vessel of 1,500 tons; 1 vessel of 2,000 tons; 1 vessel of 2,500 tons; 1 vessel of 2,800 tons; 1 vessel of 3,000 tons; and 1 vessel of 3,500 tons. The 5 vessels licensed to operate in the Southwest Pacific (off Australia and New Zealand) are as follows: 1 vessel of 299 tons; 1 vessel of 990 tons; 2 vessels of 1,850 tons; and 1 vessel of 2,000 tons. (Nihon Keizai Shimbun, November 29, 1963; Suisan Tsushin, November 28, 1963.)

ATLANTIC TRAWL FISHERY TRENDS, NOVEMBER-DECEMBER 1963:

The Japanese trawler Aoi Maru No. 2, (1,104 gross tons), which had been operating in the North Atlantic Ocean off Newfoundland for approximately a year, arrived at the Japanese port of Nagoya on November 24, 1963. The trawler was scheduled to depart for the North Atlantic fishing grounds again in late January 1964. (Suisan Tsushin, November 27, 1963.)

The Japanese Fisheries Agency authorized Japan's two largest fishing companies to conduct experimental trawl fishing in the Atlantic Ocean off Argentina for a period of one year, beginning December 1, 1963. One of the companies plans to use the 1,800-ton trawler Taiyo Maru No. 66. The other company will work from the 1,100-ton trawler Ikoma Maru. The Fisheries Agency has defined the experimental trawling area as the waters south of latitude 25° S. and west of longitude 40° W. (Suisan Keizai Shimbun, December 11, 1963.)

The Fisheries Agency is reported to have under study a plan to permit distant-water trawlers, operating out of overseas bases such as those in the Atlantic Ocean, to transfer their catches at sea. The plan, if ap-

Japan (Contd.):

proved, is expected to assist materially the operating efficiency of trawlers under 1,000 gross tons. (Suisan Keizai Shimbun, December 11, 1963.)

SAURY FISHERY PRODUCTION AND EXPORT TRENDS LATE NOVEMBER 1963:

The Japan Saury Sales Company was reported early in December 1963 to have contracted to sell a total of 90,000 cases of canned saury (80,000 cases of No. 1 small and 10,000 cases of No. 4) to Egypt. The sale was concluded at export prices of US\$6.54 per case for No. 1 small and \$6.53 per case for No. 4, f.o.b. Japan, with shipment to be made pending issuance of an import license by the Egyptian Government. The import license was expected to be issued by the end of 1963.

Saury fishing in Japan, which was very poor as of early November, picked up sharply after mid-November with 4,000-5,000 metric tons per day being landed. The increased landings resulted in a sharp drop in the ex-vessel price, from the US\$103 a ton reported in early November to about \$50 a ton in late November. To stabilize landings and prices, the National Saury Production Adjustment Association began to curtail fishing operations by closing the fishery for 48-hour periods every 5-7 days, depending on fishing conditions. On December 5, the ex-vessel prices of saury at the fishing ports of Kesen-numa, Onagawa, and Ishinomaki had recovered somewhat and were quoted at \$71-78 a ton. (Suisan Tsushin, December 2, 7, & 9; Nihon Suisan Shimbun, November 27, 1963; and other sources.)

PLANS CALL FOR DOUBLING SALMON HATCHERY FACILITIES:

In 1962, Japan's Fishery Agency began a three-year program to double the number of artificially hatched salmon to 1,000 million fish a year. However, a curtailment of funds reduced the capital from US\$1,667,000 a year to \$750,000 a year. Due to this development, the privately supported Japan Fisheries Association, contributor of one-third of the funds for the Government program (initial plan \$556,000 a year, now \$250,000), is plan-

ning to initiate its own program to supplement the present plan. To this end the Fisheries Association will establish a new salmon hatchery in Eastern Hokkaido costing about \$278,000 over a two-year period.

It is evident that the Japanese authorities are putting considerable effort into the improvement of their facilities. One of the best stations is at Abashiri on the Sea of Okhotsk where modern facilities are producing about 20 million small salmon a year. That station is particularly effective because the salmon are released into a lake for further growth before leaving for the sea.

One problem, however, that remains outstanding in Hokkaido is the effect on naturally spawned salmon of industrial waste and agricultural chemicals which are increasingly polluting the rivers. (United States Embassy, Tokyo, December 3, 1963.)

UNMANNED OCEANOGRAPHIC STATIONS TO BE SET UP OFF COAST:

The Japanese Fisheries Agency has announced a three-year plan to establish 42 unmanned oceanographic observation towers off various coastal areas of Japan beginning in FY 1964 (April 1964-March 1965) as part of a long-range program to forecast oceanographic and fishing conditions. The unmanned towers will continuously record oceanographic conditions in coastal waters where severe changes in sea conditions are believed to exert considerable influences on the coastal fisheries. Initially 10 of these towers will be installed off nine prefectures during FY 1964. (Suisan Keizai Shimbun, November 27, 1963.)



Malaysia

MARKET TRENDS FOR IMPORTED CANNED SARDINES:

A recent survey of Malaysian markets shows that sales of United States canned sardines are as popular as other brands in the higher income groups and that there is no particular preference as to type of can or pack. In the lower income groups, canned sardines from Japan (which are lower-priced and of acceptable quality) are reported to be most popular. United States sardines packed in to-

Malaysia (Contd.):

Type and Price of Canned Sardines by Country of Origin			
Size, Type of Can and Pack	c.i.f. Price/Case		Country of Origin
	M\$	US\$	
100/3½- to 4-oz. without key (dingley):			
Soybean oil	28.00	9.15	Canada
Tomato sauce	28.00	9.15	"
Olive oil	75.00	24.50	"
100/3½- to 4-oz. (flats)	28.00	9.15	Canada
48 or 24/15-oz. (oval cans):			
Tomato sauce	34.00	11.11	Japan
Natural or brine	39.00	12.75	"
48 or 24/8-oz. (oval cans):			
Tomato sauce	18.00	5.88	Japan
Soybean oil	18.00	5.88	"
Natural or brine	19.00	6.21	"
48 or 24/15-oz. (tall cans):			
Tomato sauce	42.00	13.73	U. S. (Calif.)
Natural or brine	42.00	13.73	"
100/5-oz. (tall cans):			
Tomato sauce	32.00	10.46	U. S. (Calif.)
Natural or brine	32.00	10.46	"

mato sauce in 5-ounce tall cans are also popular with the lower income groups. Many stores reported that they have discontinued selling canned herring and pilchard, especially United States brands, because of a lower demand, due mainly to price and lack of supplies. Canned salmon and horse mackerel from the United States are not much in demand, although in the lower income groups there is a market for Japanese horse mackerel packed in tomato sauce. With the exception of the higher income groups, the lower income groups prefer canned fish packed in tomato sauce.

The information in the table on canned sardines marketed in Malaysia was obtained from the survey. (United States Embassy, Kuala Lumpur, December 20, 1963.)

* * * * *

FISHERIES TRENDS, THIRD QUARTER 1963:

A temporary ban on trawling in Malaysian waters was imposed by the Government in July 1963. Trawling permits had been sought by many prospective enterprises, including a number backed by joint Japanese-Malaysian interests. The lifting of the trawling ban depends on the completion of plans being drawn by the Ministry of Agriculture and Cooperatives to ease the hardships that trawl fishing will cause fishermen using more primitive methods.

In September 1963, prospects for improved east coast fishery marketing facilities were brightened by a M\$1.5 (US\$490,000) million Canadian contribution through the Colombo Plan. The money will provide cold-storage facilities at several locations. The first freezing plant will be installed at the port of Kuantan in 1964 and used by the Government to popularize local frozen fish. (United States Embassy, Kuala Lumpur, November 26, 1963.)



Morocco

CANNED FISH EXPORTS, JUNE-SEPTEMBER 1962-63:

Exports of canned fish by Morocco during June-September 1963 were substantially higher than for the same period in 1962, but lower than in 1961. Total canned fish exports amounted to 963,942 cases during June-September 1963 as compared with 897,382 cases in 1962, and 1,053,531 cases in 1961. Exports of sardines during the 4-month period of 1963 totaled 728,542 cases as compared with 733,574 cases in 1962 and 828,393 cases in 1961. Canned tuna exports amounted to 36,737 cases during June-September 1963 as compared with 60,125 cases in 1962. Exports of other fish rose to 198,663 cases from 103,684 cases in 1962. (United States Embassy, Rabat, November 28, 1963.)



Netherlands

VIEWS ON NORTHEAST ATLANTIC AND EUROPEAN FISHERY POLICIES:

The Netherlands Minister of Agriculture and Fisheries has announced that the Northeast Atlantic Fisheries Commission, set up under the 1959 Northeast Atlantic Fisheries Convention, will hold its first meeting in The Hague, May 11-17, 1964, at the invitation of his Government. The meeting should show whether participants are willing to implement the Convention's provisions which are designed to prevent overfishing in the northeastern section of the Atlantic Ocean. As far as the Netherlands is concerned, measures going beyond those laid down in the previous Convention are acceptable only if made subject to international inspection.

Netherlands (Contd.):

The Minister welcomed a British initiative in inviting European Economic Community (EEC) and European Free Trade Association (EFTA) countries as well as Ireland, Iceland, and Spain to an international conference in London on December 3, 1963, to discuss the problem of unilateral extension of national fishing limits. In addition other problems were aired including access to fishing areas, trade in fish, fisheries policy, and police supervision.

The Government is also in favor of a common EEC fisheries policy which would rule out any national measures detrimental to Community partners and preferably make territorial waters of EEC countries accessible without restriction to all fishermen of all present or future members. (United States Embassy, The Hague, December 10, 1963.)

OYSTER INDUSTRY DECLINES:

In the 1961/1962 season, a total of 30 million oysters was harvested in the Netherlands, but a few more years may see the end of this century-old oyster culture which is concentrated around the port of Yerseke in Zeeland, that province of islands in southwest Holland. The Oosterschelde estuary (which is the cradle of the Dutch oyster industry) will be cut off from the sea by the construction of the Delta flood-prevention dyke. That famous oyster area will become a lake unfit for oyster culture when the Delta project is completed in about 10 years.

The intense winter cold of the 1962/1963 season created a crisis in the industry. Out of 150 million oysters, only 0.05 percent survived, and those few were not capable of continuing propagation. Under normal circumstances, Dutch oyster farmers would not have hesitated to import foreign oysters to continue their trade. But shortly after the winter disaster, the threatened industry was further discouraged by cancellation of the Government's project to develop an artificial oyster-rearing basin. (The artificial rearing project was said to have failed because of changes in the structure of the Delta flood control project.)

It was reported in the fall of 1963 that only 13 of the 150 Dutch oyster farmers would continue their culture. The others had

various choices. Indemnification was expected from the Government. Some were reported to be planning to switch to mushroom farming. Others were discussing the possibility of seeking new areas for oyster cultivation in foreign countries. (Fishing News, October 4, 1963.)

Note: See Commercial Fisheries Review, November 1961 p. 58.



Nicaragua

SPINY LOBSTER FISHING REGULATIONS ESTABLISHED:

By a decree, effective November 20, 1963, the Government of Nicaragua has established regulations on spiny lobster fishing in Nicaraguan waters. The regulations are as follows:

Article 1. It is forbidden to catch, buy, keep, process, store, transport, sell, and export lobsters which show external eggs, as well as to remove them by any means.

Article 2. It is forbidden to catch lobsters whose length is inferior to 20 centimeters (7.9 inches), measured from the "pinzners" to the terminal part of the tail.

Article 3. Upon the violation of the dispositions contained in the present decree, when reported by the respective inspector, the Director of Natural Resources of the Ministry of Economy is authorized to impose a fine on the violator, not higher than Five Thousand Cordobas (\$5,000 or about US\$714) and not less than One Thousand Cordobas (\$1,000 or about US\$143). In case of repetition of the offense, the imposed fine can be increased to double in each case. The payment will be effective by law.

Besides the established sanctions in the above paragraph, the respective authorities can impose on the offender the following penalties: thirty days of arrest, confiscation of the seized lobster, of the working implements, and the cancellation of the license or fishing permit.

Article 4. In case of arrest, referred to in the above article, the police judges

Nicaragua (Contd.):

will be competent in their respective jurisdictions, admitting all proofs and resources established by the Law. (United States Embassy, Managua, December 12, 1963.)



Norway

EXPORTS OF CANNED FISH,
JANUARY 1-SEPTEMBER 28, 1963:

Norway's total exports of canned fish in January 1-September 28, 1963, were 10.5 percent less than in the same period of 1962. The decline affected all of Norway's principal canned fish products.

Norwegian Exports of Canned Fish, January 1-September 28, 1962-63		
Product	1/1963	1962
	. (Metric Tons) .	
Brisling	3,782	4,479
Small sild	10,289	10,781
Kipperred herring	2,318	3,175
Soft herring roe	621	719
Sild delicatessen	321	369
Other canned fish	2,410	2,428
Shellfish	1,147	1,388
Total	20,888	23,339
1/Preliminary.		

In 1963, the small sild canning season opened on May 2. By October 26, 1963, the small sild pack amounted to 537,087 standard cases, up 15.6 percent from the pack of 464,470 cases in the same period of 1962.

The 1963 brisling packing season extended from June 4 to October 15. At the close of the 1963 season, a total of 276,904 standard cases of canned brisling had been packed, a decline of 33.6 percent from the pack of 416,887 cases in the previous year. The Norwegian brisling catch was rather poor in the fall of 1963.

The production of canned mackerel up to October 12, 1963, amounted to 1,365 metric tons as compared with 2,062 tons by the same date in 1962. (Norwegian Cannery Export Journal, November 1963.)

PROPOSED REFINANCING OF
STATE-CONTROLLED
FISH-PROCESSING COMPANY:

A Government proposal for the refinancing of A/S Finnmark og Nord-Troms Fiskeindustri (FiNoTro), a fish-processing company operating seven plants in the Troms and Finnmark Counties of northern Norway, was submitted to the Norwegian Storting (Parliament) in late 1963. More than 90 percent of the stock of FiNoTro is owned by the Government and the rest of the shares are held by various fishing unions and the Norwegian Society of Cooperatives. The proposed refinancing would provide FiNoTro with N. Kr. 12 (US\$1.7 million) to modernize its plants, and Kr. 2.5 million (\$350,000) to settle certain debts. A total of Kr. 10 million (\$1.4 million) of the company's Kr. 14.5 million (\$2.0 million) share capital is considered lost and is to be written off. The Storting was asked to grant Kr. 12 million (\$1.7 million) in the current fiscal year for new share capital in FiNoTro, and to authorize the Norwegian Ministry of Finance to transfer Kr. 2.5 million (\$350,000) from a special fisheries fund to FiNoTro. The remainder of the capital needed will be supplied by the other shareholders in FiNoTro. The bill also recommends certain measures designed to improve the efficiency of the company, including a reorganization of its management. Two of the seven plants making up FiNoTro are to be closed down. (United States Embassy, Oslo, Norway, December 7, 1963.)



Panama

SPINY LOBSTER EXPLORATORY
FISHING PROJECT CONCLUDED:

M/V "Pelican" Cruise 16 (December 5-19, 1963): The last survey of stocks of spiny lobsters off Panama by the chartered commercial fishing vessel Pelican was conducted during a 2-week cruise in December 1963 when experimental and simulated commercial lobster fishing was carried out in the northwest section of the Gulf of Panama. The cruise off Panama was one of a series conducted by the U. S. Bureau of Commercial Fisheries through an interagency agreement with the U. S. Agency for International Development (AID) Mission to Panama as an Alliance for Progress program.

Panama (Contd.):

The total catch during the cruise in December 1963 amounted to 2,847 lobsters (2,758 pounds). The catch was composed of 1,034 spiny lobsters (*Panulirus gracilis*) or 1,255 pounds, and 1,813 rock lobsters (*Scyllarides* sp.) or 1,503 pounds.

The first week of the cruise was devoted to training and involved the use of 180 wood-slat traps. During that time, 154 lobsters (227 pounds) were caught.

During the second week, operations were centered in the San Carlos-Rio Hato area where trawling on rocky bottom was conducted with a 40-foot shrimp trawl rigged with plastic mud rollers and a tickler chain. Of the total of 45 drags (averaging 90 minutes each), 40 were successful in taking lobsters. The total trawling catch was 990 spiny and 1,803 rock lobsters. The best drag produced 207 lobsters. Gear damage was limited to 1 torn net and 4 broken tickler chains.

Comparative drags made during daylight and nighttime revealed no discernable differences in catch rate, indicating good possibilities for successful round-the-clock commercial fishing.

The presently unused rock lobster, which is of excellent quality in both meat yield and flavor, appears suitable for commercial exploitation.

A brief visit was made to the scallop fleet which was working the beds discovered during Pelican Cruise 15 in September 1963. The 15 vessels in the area were each fishing with two 6-foot dredges. Due to high catch rates, the fishermen were allowing only 5 to 7 minutes per drag. Full vessel loads were being taken in two days of fishing, working only during daylight hours.

The M/V Pelican was scheduled to return to the United States in early 1964.

Note: See Commercial Fisheries Review, December 1963 p. 76.



Peru

FISHING INDUSTRY
LONG-RANGE FORECAST:

In Peru, an annual growth rate of 5 percent for the tuna industry and 12 percent for

the fish meal industry during the current decade is predicted by the Peruvian National Society of Industries in a publication based upon material from the Peruvian Central Reserve Bank's study "Programacion del Desarrollo."

The forecast of 5 percent growth in the tuna industry for the period 1961 to 1971 was based on estimated domestic Peruvian consumption alone. Increased Japanese competition in foreign tuna markets could limit the growth of Peruvian export tuna sales.

It was estimated that the international market for fish meal could reach 3 million metric tons per year by 1967. Assuming Chilean production may reach 550,000 tons, Icelandic 150,000 tons, South African 230,000 tons, and other countries 300,000 tons, the demand for Peruvian meal could still reach 2 million tons. This assumption was the basis for the prediction that Peruvian fish meal production increases for the period 1961 to 1971 should average 12 percent per annum. The future of fish oil production was viewed as uncertain, and no estimate was made of possible increases. Production of sperm oil and whale meal will remain about at present levels, according to the forecast. (United States Embassy, Lima, December 5, 1963.)

ESTIMATED EXPORTS OF FISH MEAL
AND FISH OIL, 1963:

Unpublished estimates of Peru's 1963 exports of fish meal and fish oil were: fish meal, 1,160,000 metric tons; fish oil, 106,863 tons. Fish meal stocks on hand as of September 30, 1963, were estimated to be 114,659 tons. No estimates were given on stocks of fish oil on hand as of that date.

Although Peru's production of fish meal in 1963 was expected to be less than earlier predicted, the January-October 1963 production was well ahead of the same period a year earlier (903,437 metric tons as against 819,638 tons).

Exports of fish meal in 1963 were up from 1962 as a result of the good world demand, and stocks of both fish meal and fish oil at the end of 1963 were expected to be lower than usual. (United States Embassy, Lima, December 20, 1963.)

Peru (Contd.):

FISH MEAL EXPORT AGREEMENT EXTENDED:

By the Supreme Decree of December 12, 1963, the Peruvian Government ratified for another three years the international fish meal export agreement which was originally signed in Paris on October 1, 1960, by representatives of the Peruvian National Fisheries Society (Sociedad Nacional de Pesqueria) and the international Fish Meal Exporters Organization (FEO).

FEO establishes quotas for fish-meal exporting countries in order to maintain a balance between supply and demand. Under the original Paris agreement, Peru was allocated an export quota of 600,000 metric tons. Due to the rapid expansion of the fish meal market, the Peruvian quota has been steadily increased, having been set at 1 million long tons for 1963 and 1.2 million long tons for 1964. (United States Embassy, Lima, January 3, 1964.)

**Poland****LANDINGS OF MARINE PRODUCTS AND SIZE OF FISHING FLEET, 1962-63:**

Poland's target for ocean fish landings in 1963 was reported by the periodical *Zycie Warszawy* of December 13, 1963, to be more than reached. The prediction was that the 1963 marine fish landings would be at least 207,000 metric tons. As a result of the good landings, market supplies for home consumption increased. The target for the 1964 ocean fish landings has been set at 222,000 tons.

Type of Vessel	1962	1961	1960	1955	1950
	(Number of Vessels)				
Factory trawlers	5	2	1	-	-
Super trawlers	66	57	53	8	-
Other trawlers	9	11	13	20	24
Lugger-trawlers	46	46	50	34	-
Luggers	1	3	3	3	3
Cutters	545	538	532	397	338
Auxiliary vessels	3	3	3	2	-
Total	675	660	655	464	365
Total Gross Registered Tons	104,900	91,700	87,600	43,200	18,200

1/Motor type B-20, steam type: B-14 and B-10.

In 1962, Poland's marine fish landings were down 3.1 percent from the previous

year due to a sharp decline in the herring catch. Cod landings, however, were up substantially from 1961 and there were good increases for sprats and other species.

Fishery	1962	1961	1960	1959	1950
	(Metric Tons)				
Groundfish	47,300	40,800	51,100	40,300	48,200
Herring	76,100	93,600	93,600	52,000	9,500
Sprats	13,700	11,300	9,900	5,100	1,200
Other	27,100	23,600	13,400	9,700	7,300
Total	164,200	169,300	168,000	107,100	66,200

Poland's fleet of sea fishing vessels continued to expand in 1962. The fleet gained 3 factory trawlers that year, as well as 9 super trawlers, and 7 cutters. There was a decline in the number of smaller trawlers and vessels classified as "luggers." The gross registered tonnage of the fishing fleet in 1962 was 14.4 percent greater than in 1961, and was about five times greater than in 1950. (Concise Statistical Yearbook of Poland, 1963.)

Note: See *Commercial Fisheries Review*, February 1963 p. 87.

**Portugal****CANNED FISH EXPORTS, JANUARY-SEPTEMBER 1963:**

Portugal's total exports of canned fish during the first 9 months of 1963 were down 7.8 percent from those in the same period of 1962, due primarily to lower exports of sardines. The decline was partly offset by a considerable increase in exports of mackerel. Sardines accounted for 73.7 percent of the 1963 exports of canned fish, followed by mackerel with 9.8 percent, anchovy fillets with 7.4 percent, tuna and tuna-like fish with 5.6 percent, and chinchards with 2.9 percent.

Product	January-September			
	1963		1962	
	Metric Tons	1,000 Cases	Metric Tons	1,000 Cases
In Oil or Sauce:				
Sardines	33,924	1,785	39,305	2,067
Chinchards	1,341	71	1,626	85
Mackerel	4,504	180	1,722	69
Tuna and tuna-like	2,590	86	2,833	94
Anchovy fillets	3,434	343	4,253	425
Others	258	14	214	11
Total	46,051	2,479	49,953	2,751

Portugal's principal canned fish buyers during January-September 1963 were Italy

Portugal (Contd.):

with 7,664 metric tons, followed by Germany with 7,397 tons, the United Kingdom 5,276 tons, the United States 5,073 tons, France 3,931 tons, and Belgium-Luxembourg 2,992 tons. (Conservas de Peixe, November 1963.)

* * * * *

CANNED FISH PACK, JANUARY-SEPTEMBER 1963:

Portugal's total pack of canned fish in oil or sauce in the first 9 months of 1963 was down about 25 percent from that in the same period of 1962. The decline was due mainly to a sharp drop in the pack of sardines.

Portuguese Canned Fish Pack, January-September 1962-1963				
Product	January-September			
	1963		1962	
	Metric Tons	1,000 Cases	Metric Tons	1,000 Cases
<i>In Oil or Sauce:</i>				
Sardines	19,818	1,043	30,781	1,620
Chinchards	2,315	123	2,724	143
Mackerel	5,414	216	5,838	233
Tuna and tuna-like	5,381	180	4,856	162
Anchovy fillets	2,956	296	3,938	394
Others	347	18	433	23
Total	36,231	1,876	48,570	2,575

Landings of sardines in January-September 1963 totaled 65,285 tons. For January-August, tuna landings were 905 tons and bonito 154 tons--mostly used for canning. (Conservas de Peixe, November 1963.)



South-West Africa

QUOTAS FOR 1963 AND 1964

PILCHARD FISHERY INCREASED:

The Walvis Bay fishing industry in South-West Africa has been granted an additional pilchard quota of 60,000 short tons for the 1963 season, to be divided equally among the six factories. This makes a total quota for the 1963 season for the pilchard industry of 600,000 tons, 100,000 tons per factory. By the end of August the total catch was 433,285 tons.

In announcing this extra quota the South-West Africa Administration stipulated that it would not be a permanent increase.

The extra quota prolonged the season at Walvis Bay for another month and the first factories closed early in October.

Most of the production from this extra quota was reduced to fish meal and used to meet an order from Japan for 20,000 tons of fish meal. Delivery of this order was due late in 1963 or early in 1964. It is also understood that the Japanese have been very impressed with the quality of South African fish meal.

The extra quota had to be granted to enable the industry to meet this order, as earlier production was sold in advance. It was estimated that at the end of the normal season the industry had about 5,000 tons of fish meal on hand.

The extra 60,000 tons have been given on the licenses of the two new fishing concerns in South-West Africa which were licensed by the Administration to catch and process pilchards into fish meal and oil. This means that the existing six factories will pay a share to the new companies for use of part of their quota.

At the time the new firms were licensed it was decided to fix the permanent yearly quota for the South-West African pilchard industry at 90,000 tons per factory, or 720,000 tons for the industry.

The two new factories must be in full production by the start of the 1965 season and may in the meantime work their quota through an existing factory. (The South African Shipping News and Fishing Industry Review, October 1963.)



Sweden

FISHING INDUSTRY TRENDS, 1962, AND ESTIMATE FOR 1963:

Summary: An oversupply of herring in 1963 forced prices down and checked the record prosperity experienced by the Swedish fishing industry in 1962. The large herring landings in 1963 were expected to result in new limitations on landings by both Sweden and Denmark. The extension of fishing limits by other countries has not yet affected Swedish fishermen, but an agreement made with Norway will handicap Swedish shrimp fishermen in 1965. No large change in the structure of the Swedish fishing fleet is expected within the next few years.

Sweden (Contd.):

Table 1 - Swedish Over-all Fishery Landings^{1/}, by Principal Species, 1961-1962

Species	Quantity		Value					
	1962	1961	1962		1961			
	(Metric Tons)		S. Kr.	US\$	S. Kr.	US\$		
Herring . . .	145,121	133,435	86,685	16,676	66,029	12,703		
Baltic herring	16,520	16,100	11,104	2,136	10,727	2,064		
Sprat	5,054	4,949	4,589	883	4,473	861		
Cod	30,600	30,839	22,552	4,339	22,770	4,380		
Haddock . . .	3,321	4,410	3,993	768	4,918	946		
Whiting . . .	3,051	1,468	2,328	448	1,263	243		
Ling	1,227	1,214	1,696	326	1,550	298		
Other cod species . . .	4,270	3,612	4,458	858	4,043	778		
Flatfish . . .	3,308	3,137	5,427	1,044	5,176	996		
Mackerel . . .	14,627	13,593	10,796	2,077	8,719	1,677		
Eel	1,742	1,911	12,413	2,388	11,403	2,194		
Salmon	1,339	1,564	6,078	1,169	7,586	1,459		
Shrimp	5,724	4,462	25,763	4,956	20,304	3,906		
Other shellfish	1,534	1,774	5,879	1,131	5,862	1,128		
Unclassified fish . . .	4,073	4,009	5,166	994	5,120	985		
Industrial fish . . .	41,433	26,255	7,316	1,407	4,336	834		
Total	282,944	252,732	216,243	41,600	184,279	35,452		

^{1/}Includes landings in foreign ports.

Table 2 - Swedish Fishery Landings in Swedish Ports and in Foreign Ports, by Principal Species, 1961-1962

Species	Landings in Swedish Ports		Landings in Foreign Ports	
	1962	1961	1962	1961
	(Metric Tons)			
Herring	51,766	62,556	93,355	70,879
Baltic herring	16,520	16,100	-	-
Sprat	4,872	4,736	182	213
Cod	29,005	30,118	1,595	721
Haddock	2,779	3,946	542	464
Whiting	1,742	1,158	1,309	310
Ling	1,210	1,196	17	18
Other cod species . . .	2,961	2,787	1,309	825
Flatfish	3,186	3,055	122	82
Mackerel	5,405	6,780	9,222	6,813
Eel	1,742	1,911	-	-
Salmon	1,339	1,564	-	-
Shrimp	5,712	4,460	12	2
Other shellfish	1,528	1,773	6	1
Unclassified fish . . .	3,719	3,637	354	372
Industrial fish	31,958	21,883	9,475	4,372
Total	165,444	167,660	117,500	85,072

Table 3 - Swedish Exports^{1/} of Fishery Products, by Commodity Group, 1960-1962

Product	1962			1961			1960		
	Million S. Kr.	Million US\$	1,000 Metric Tons	Million S. Kr.	Million US\$	1,000 Metric Tons	Million S. Kr.	Million US\$	1,000 Metric Tons
Fresh and frozen fish	100.1	19.2	149.0	76.3	14.7	128.7	69.1	13.3	119.5
Fresh and frozen fish fillets	0.9	0.2	0.4	1.0	0.2	0.4	1.0	0.2	0.3
Salted, spiced, or sugar-salted herring	2.9	0.5	2.0	2.0	0.4	1.6	3.5	0.7	3.4
Other salted, dried, and smoked fish	0.4	0.1	0.0	0.4	0.1	0.0	0.5	0.1	0.1
Shellfish	1.4	0.3	0.5	1.0	0.2	0.5	1.0	0.2	0.4
Canned fish and shellfish	9.9	1.9	2.0	8.2	1.6	1.8	8.2	1.6	1.9
Other prepared fish products	1.1	0.2	0.3	1.0	0.2	0.2	1.8	0.3	0.5
Total	116.7	22.4	154.2	89.9	17.4	133.3	85.1	16.4	126.1

^{1/}Included are direct landings by Swedish fishermen in foreign ports: in 1962--117,500 metric tons, valued at Kr. 69.9 million (US\$13.4 million); in 1961--85,300 metric tons, valued at Kr. 40.6 million (\$7.8 million); and in 1960--66,100 metric tons, valued at Kr. 30.2 million (\$5.8 million).

Landings: In 1962, Swedish fishery landings were up 12.0 percent in quantity and 17.3 percent in value from those in 1961, due to heavier direct foreign landings and higher prices in foreign ports. But in 1963 an over-supply of herring filled cold-storage plants, drove prices down, and caused Swedish fishermen's income to drop by almost 30 percent. Limitations on landings in Swedish and Danish ports in 1963 were imposed too late to prevent market gluts. In the first half of 1963, direct landings by Swedish vessels in Danish and West German ports totaled 66,813 metric tons as compared with 45,345 tons in the same period of the previous year.

Foreign Trade: In 1962, Danish over-all exports of fishery products (including direct landings in foreign ports) were up 15.7 percent in quantity and 29.8 percent in value from those in 1961. Again, the increase in exports was due mainly to larger direct landings in foreign ports by Swedish vessels. Export landings and shipments of fresh and frozen fish accounted for almost 97 percent of the total exports. The leading buyer of Swedish fishery products was Denmark, followed by West Germany and East Germany.

Swedish imports of fishery products in 1962 were up 11.2 percent in value from those in 1961, but the quantity was almost the same in both years. Norway was the leading supplier of Swedish fishery imports, followed by Denmark and Iceland.

Fishing Fleet: The value of the Swedish fishing fleet in 1961 was calculated to be S. Kr. 217.5 million (US\$41.9 million) for fishing craft and Kr. 76.4 million (\$14.7 million) for gear, indicating a total investment of Kr. 293.9 million (\$56.6 million). It was estimated that in 1962 the value of fishing vessels increased by 25 percent and that of gear by 3 percent. In the first half of 1963, only 1 new

Sweden (Contd.):

Table 4 - Value of Swedish Exports^{1/} of Fishery Products, by Country of Destination, 1960-1962

Country of Destination	1962	1961	1960
	. (Million Swedish Kronor)		
Denmark	74.3	35.3	25.5
East Germany	11.1	18.4	21.5
France	2.5	1.4	0.8
United Kingdom	1.9	3.5	3.1
Norway	2.8	1.9	1.5
United States	2.5	2.8	2.6
West Germany	14.8	19.6	22.1
Other countries	6.8	7.0	7.6
Total Value of Swedish Fishery Exports ^{1/}	116.7	89.9	2/84.7

^{1/}Includes the value of direct landings in foreign countries.^{2/}Does not agree exactly with corresponding total in table 3.

steel trawler was delivered as compared with 18 in 1962. It appears that the modernization of the Swedish fishing fleet has leveled off with Swedish fishermen carefully studying market developments before planning further investments.

The number of full-time Swedish fishermen in 1962 was 8,967, only a small decrease from the 9,041 reported the previous year. Better fishery employment opportunities on

the west coast in 1961 halted that area's downward trend and arrested the national decline in fishing employment evident since 1946.

Outlook: Little change in the structure of the Swedish fishing fleet is anticipated in the next few years. The size of vessels used by Swedish fishermen is not expected to exceed 100 feet, the size of the largest trawlers now in use. Modernization of the fleet will continue on a small scale in the form of more powerful engines and more efficient gear and equipment. The number of fishermen is expected to decrease in the areas where fishing is not as profitable as employment in other industries. This will particularly affect the number of fishermen on the east and south coast of Sweden.

Herring: The large herring landings in 1962 and particularly in the summer and fall of 1963 revealed that the organizations concerned with landings and prices do not have sufficient control over the situation during periods when there is an oversupply. Representatives of Swedish and Danish fishery organizations in late 1963 discussed the question of landings in Danish ports. Danish fishermen and their organizations, which had

Table 5 - Swedish Imports^{1/} of Fishery Products, by Commodity Group, 1960-1962

Product	1962			1961			1960		
	Million S. Kr.	Million US\$	1,000 Metric Tons	Million S. Kr.	Million US\$	1,000 Metric Tons	Million S. Kr.	Million US\$	1,000 Metric Tons
Fresh and frozen fish	39.3	7.5	14.3	33.3	6.4	14.0	31.1	6.0	13.0
Fresh and frozen fish fillets	26.5	5.1	8.1	18.1	3.5	5.9	17.0	3.3	5.8
Salted, spiced, or sugar-salted herring	32.9	6.3	24.8	35.0	6.7	27.3	22.4	4.3	19.5
Other salted, dried, and smoked fish	8.1	1.6	2.1	9.2	1.8	2.7	7.0	1.3	2.2
Shellfish	8.9	1.7	2.0	7.6	1.5	1.6	5.4	1.0	1.0
Canned fish and shellfish	21.0	4.0	3.7	19.5	3.7	3.4	20.1	3.9	3.4
Other prepared fish products	9.9	1.9	2.8	9.1	1.7	3.0	8.0	1.5	3.0
Total	146.6	28.1	57.8	131.8	25.3	57.9	111.0	21.3	47.9

^{1/}Included are direct landings by Danish fishermen in Swedish ports: in 1962--600 metric tons, valued at Kr. 2.5 million (US\$0.5 million); in 1961--200 metric tons, valued at Kr. 1.6 million (\$0.3 million); and in 1960--100 metric tons, valued at Kr. 0.6 million (US\$0.1 million).

Table 6 - Value of Swedish Imports^{1/} of Fishery Products, by Country of Origin, 1960-1962

Country of Origin	1962	1961	1960
	. (Million Swedish Kronor)		
Canada	1.7	2.0	1.8
Denmark	42.1	38.4	31.7
East Germany	-	-	0.1
Iceland	21.2	19.3	9.8
Japan	2.4	2.0	3.6
Norway	58.8	49.9	45.8
Poland	2.0	1.1	1.4
Portugal	3.6	3.0	2.6
Soviet Union	7.3	7.9	8.3
United States	1.7	1.7	1.2
West Germany	1.5	2.0	1.8
Other countries	4.3	4.5	3.1
Total Value of Swedish Fishery Imports	146.6	131.8	2/111.2

^{1/}Includes the value of direct landings by Danish fishermen in Swedish ports.^{2/}Does not agree exactly with corresponding total in table 5.

previously neglected limitations on herring landings and the maintenance of minimum prices on herring for consumption, agreed to follow the principles established by Swedish fishermen and their organizations. The heavy landings were partly the result of a good supply of 1960 class herring, but the increase in the number of fishing vessels from Denmark, West and East Germany, and the United Kingdom contributed to the large landings. Swedish fishery organizations have emphasized the importance of having a domestic processing industry with a high capacity, but fluctuations in the market have been a hampering factor.

It has been suggested that Swedish west coast fishermen could change over from fish-

Sweden (Contd.):

ing for herring to fishing for white fish. But the supply of white fish in the North Sea has been smaller than usual and herring fishing is under normal circumstances much more profitable. In addition, the craft and gear used by those fishermen have been adapted particularly to herring fishing.

As can be seen from recent import data (table 5), Sweden imports large quantities of salted, spiced, and sugar-salted herring. Previously, Swedish fishermen were actively engaged in herring fishing with drift nets in Icelandic waters, but for various reasons this type of fishing ceased. In 1963, however, the west coast fishermen's organization put up a guarantee, and 8 west coast trawlers made a 2-months trip to Icelandic waters in order to fish for herring with floating trawls. The experiment was not completely successful as out of an anticipated catch of 4,000 barrels, the vessels returned with only 2,000 barrels of salted herring. Bad weather with heavy storms and a general poor supply of herring were the reasons for the disappointing result. It was proved, however, that it is possible to catch Icelandic herring with floating trawls. The experiment also showed a possible way for the fishing organizations to decentralize fishing areas and landing ports, thus reducing the number of vessels in certain overworked areas and limiting landings in certain ports.

Shrimp: Shrimp fishermen on the northern part of the Swedish west coast will be excluded as of January 1, 1965, from a rich deep-water area in the Oslo Fjord. The west coast fishermen's organization has complained bitterly over the agreement between Norway and Sweden creating the exclusive area and will request financial assistance from the Swedish Government for the loss that fishermen may suffer. The organization has also proposed a Swedish import ban on Norwegian shrimp and crab, claiming that Norwegian fishermen are selling shellfish at prices which make it impossible for Swedish fishermen to compete. (United States Consulate, Goteborg, November 29, 1963.)



Taiwan

SHRIMP EXPORTS INCREASED IN 1963:

Exports of shrimp to Japan and the United States were reported by the Industrial Development and Investment Center of the Republic of China to have amounted to about 250,000 pounds prior to the date of the report (October 31). As of that date, an additional 120,000 pounds were ready for shipment to Japan. The Center estimated that 500,000 pounds of shrimp valued at about US\$500,000 would be exported in 1963. (Taiwan Industrial Panorama, October 31, 1963.)



U.S.S.R.

FISHERIES CATCH GOAL INCREASED FOR 1964:

A 1964 goal of 4.9 million metric tons of fishery landings (including whales and other marine mammals) has been announced by the Soviet press. The 1964 goal represents an increase of about 8.9 percent over the estimated 1963 Soviet catch of 4.5 million tons. In addition to working developed fishing areas in 1964, the Soviet Union plans to send a fishing expedition into the Arabian Sea. Exploratory cruises will be conducted in the East China Sea and in the area off Iceland. (United States Embassy, Moscow, January 3, 1964.)

MARINE FISHERY PRODUCTION GOALS FOR 1963 EXCEEDED:

The Soviet periodical *Izvestiya* has announced that the 1963 U.S.S.R. plan for production of fish, marine animals (including whales), and other marine fishery products has been fulfilled ahead of schedule, with the total catch for 1963 estimated at 4.5 million metric tons. In 1962, the Soviet catch goal of 3.9 million metric tons was also reached ahead of schedule. (United States Embassy, Moscow, December 6, 1963.)

SPECIFICATIONS OF FISH FACTORYSHIPS BUILT BY WEST GERMAN SHIPYARD:

A contract to build 8 floating fish factories for the Soviet Union was negotiated in August 1963 by the Government-owned shipyard at Kiel, German Federal Republic. Although

U. S. S. R. (Contd.):

press reports at the time of the announcement of the contract stated that the vessels were to be of approximately 17,000 tons deadweight each, shipyard officials now state that the vessels will be of 10,000 tons deadweight each. Other specifications of the vessels: over-all length 545 feet; beam 79 feet; molded draft 49 feet; draft 25 feet; engine 5,600 hp. Diesel; and estimated speed 14 knots.

Unlike the whaling mothership Vladivostok and her sistership the Daljnij Vostok, which were built for the Soviets by the same shipyard, the 8 vessels on order will not be designed for whaling but will have facilities for processing fish oil, fish meal, and frozen and canned fish.

The vessels are scheduled for delivery during 1965 and 1966 and it is not now known in what areas they will operate. From a technical point of view it is reported that they will be capable of operating in a full arctic to tropic range. (United States Consulate, Hamburg, December 20, 1963.)

Note: See Commercial Fisheries Review, October 1963 p. 67; June 1963 p. 70; February 1962 p. 93.



United Kingdom

CANNED FISH MARKETING TRENDS:

The per capita consumption of canned fish in the United Kingdom increased steadily between 1953 and 1958, rising some 113 percent in the 5-year period. On the other hand, per capita consumption of canned fish in the United Kingdom is still below that in the United States. The relatively smaller use in the United Kingdom offers an opportunity for increasing sales, particularly since the British market for convenience foods is growing.

Imports satisfy 90 percent of the British market for canned fishery products. Between 1958 and 1962, the value of the imports averaged US\$95 million per year with, however, some wide annual fluctuations.

Canned salmon accounts for about two-thirds of British imports of fishery products. Since the removal of exchange

controls in 1958, British purchases of canned salmon in the United States have averaged \$6 million per year, varying from \$7 million to \$3 million per year. In 1962, the United Kingdom took about 75 percent of all United States canned salmon exports.

Canned brisling and sild sardines, pilchards, and sturgeon roe imports (which are dominated by exclusive suppliers) account for about seven percent of the value of British canned fishery imports. Excluding those products as well as canned salmon still leaves British canned fishery imports valued at about \$20 million per year. These include various packs of crabs, tuna, shrimp, lobsters, oysters, clams, sardines, roe, fish paste, and other products.

Tuna is not presently a widely recognized canned fishery product in the United Kingdom. Canned tuna imports were valued at only about \$2 million in 1961, the only year for which statistics are available. Peru supplied 80 percent of that total. British tuna consumption is probably less than three percent of canned salmon consumption. However, distributors say consumption is increasing and, in view of the growing importance of convenience foods, there is every reason to believe that high-quality tuna could be marketed on a large scale, if supported by adequate advertising. There is certainly a sales potential at least as a specialty food.

A display of canned fishery products at a Trade Center exhibit in the United Kingdom could attract attention from British distributors, buyers, caterers, and other consumers. Foods other than fish could be included in an exhibit since most buyers and importers handle a variety of lines. (United States Embassy, London, December 13, 1963.)

STERN TRAWLING REVIEWED
AT CONFERENCE:

"Stern trawling" was the subject of the first major conference organized by the British White Fish Authority. The meeting was held in Grimsby, England, September 10-11, 1963. The 300 or more delegates from nine countries were a clear indication of the anxiety of both the catching and construction sides of the industry to put stern trawling under the microscope in order to assess its true potential. Although some nations and some individual companies have already made the decision to adopt stern fishing completely, there are still those who regard it as being economic only for large distant-water vessels. This conference offered an ideal opportunity for experiences to be compared and arguments for and against to be put forward.

Many of the delegates were representing ancillary industries such as engine builders, hauling gear manufacturers, and so on, all vitally interested in the various techniques so far employed on stern trawlers, and in their effectiveness. In a comparatively new field such as this, shipbuilder, owner, and gear manufacturer must pool resources in order to achieve the most effective solution for hauling and shooting the trawl.

Value of British Imports of Canned Fishery Products,
1958-1962 and 5-Year Average

Canned Fishery Product	1962	1961	1960	1959	1958	5-Year Avg. 1958-1962
..... (Million US\$)						
Salmon	84	43	60	84	89	88
Brisling & sild sardines, pilchards, & sturgeon roe	6	7	7	5	8	7
Other canned fishery products	26	17	21	16	20	20
Total	116	67	88	108	97	95

United Kingdom (Contd.):

The subjects covered by the speakers tended to conform to this pattern. A British speaker set the scene by stating the problems of the trawler owner contemplating his first stern trawler and the economic factors which he has to consider. For the designer, a West German spoke on structural, layout and stability problems and later on hauling methods, trawl deck length, etc. Later speakers described operational experience with existing vessels; a Norwegian described how the Hekktind, Vaagtind, and smaller Hessatral and Hessagut were designed to suit the legislative and economic restrictions of Norway; a Frenchman spoke on the Thalassa and Hiram I and another speaker described Colonel Pleven II. British experience was illustrated by talks on the Junella and on the Fairy's.

The latter half of the meeting looked toward future trends, with papers from two experts of the White Fish Authority.

Certain key points of discussion were of especial interest, and the views of various speakers on those points follow:

While the stern trawler had undisputed advantages as a long duration freezer vessel, its catching power as a fresh-fish trawler must be compared with that of the less expensive side trawler. Quicker handling of the gear and ability to work in worse weather gave the stern trawler an advantage in time actually spent fishing, but this could be offset by the higher speed of the conventional vessel, which also had a morale-boosting effect on the crew, said one British speaker. In practice, a 13-knot stern trawler compared with a 15-knot side trawler in catching power. Another British speaker had observed a desirable trend on the Junella, namely a higher average age of crew, which suggested that the stern trawler might help solve labor problems, and this was confirmed by another British speaker who had found that stern trawling seemed to attract the crew most suited to it. The Junella spent 327 days out of 365 at sea and with eight men on deck could haul, change a trawl, and shoot again in 30 minutes. The Vaagtind's trawl was on the bottom for 58 percent of her sea time, and the time taken to change a trawl was 10 minutes.

The shelterdeck stern trawler, with its extra freeboard and high ramp aft was inherently safer than a side trawler. This as-

sumed that there were ample freeing ports on deck as that there were no 'tween deck apertures open. There was little evidence to show that following seas could be a great danger, but a stern gate could minimize the risk; fish hatches must be able to be closed quickly, and though pneumatics were fast, they could freeze. Hydraulics can do the job in four seconds, however. A safety gate of the Fairy type, which rose vertically by hydraulic power, could clear most cod end bags at a man's waist height so that he has something to grasp if swept aft. Stability was good on a stern trawler and there was less danger from icing.

It should not be imagined that the stern trawler's warps always lay fair behind her. Angles of 90 degrees to the vessel had been experienced and with the towing point so far aft, manoeuvring was difficult. One solution suggested was a bow propeller or "thruster," utilizing spare electric capacity when towing. The other possibility was a rudder nozzle, unless some method could be found of taking the towing strain further forward.

For the same reasons, it was difficult to come round on fouled gear as a side trawler could. Most could be cleared by hauling the ship back over the gear and using sheer force, though the Fairy ships, with their after galleys, had found it possible to go astern between the warps, and so tow the gear free. It was important that the shape of the stern and the design of the warp fairleads was such that up-and-down warps and warps at 90 degrees horizontal angle should not chafe the hull plating.

Opinion was general that, in order to get the trawl aboard in no more than three heaves, the slip deck, or trawl deck should be as long as possible--75 feet being favored as a minimum. However, as one speaker pointed out, it was questionable whether the one heave eliminated by carrying the deck right forward was worth the loss of weather protection. The advantage of the Colonel Pleven II observation bridge wing was considerable, however. As for the system whereby the bight of the net was left trailing aft, the speaker thought this would be a drawback when having to change grounds or steam back over the tow. He thought there was a risk of over-complication of hauling gear, and enumerated no less than 10 wires and messengers which had to be operated. To use independent, specialized winches and capstans would mean 7 of these--too much for remote control by one man. Proper-

United Kingdom (Contd.):

ly arranged through divided fairleads, they offered no problem to the whipping drums. The Fairtry's had used an independent cod end winch, with spring accumulator gear to absorb surge and had found it ideal. They also had a warping capstan aft for an out-haul messenger when shooting.

The French speaker described in detail, the special movable warp fairlead fitted to the sides of the Thalassa's ramp to prevent the danleno butterfly fouling the rampslip and to stop chafe between ramp and warp, bridles, etc. This seemed to provoke little interest, possibly because the detailed description suggested a lengthy procedure. In fact, there seemed little to choose between hauling methods, the long-established Fairtry method seeming to hold its own with newer systems. Emphasis was placed on the need for a barrier around which the bobbins could be hove tight to stop them rolling and split cod ends were favored by several speakers--they stopped the "bag" rolling and they halved the chance of loss through torn meshes. The Vagtind had hauled a 35-ton bag without trouble and in one heave. Rollers at the top of the ramp were no longer considered to damage the catch, and saved much chafe. "Ulstrom" was now widely used for the whole trawl and the Norwegian oval trawl door was recommended by British experience.

The split-trawl winch, with mechanically-driven warp guiding gear was generally accepted as the future pattern. There was a wider acceptance, too, of hydraulic power, remote control, and (with one notable exception) multiple specialized winches in key positions. Another British speaker, in discussing the Ross Daring, was quite confident that the skipper could handle the winch from the wheelhouse.

There was some concern over winch brakes. On a side trawler, friction was applied to the warps by their circuitous path round the bollard fairleads, but on a stern trawler the winch brakes took the whole load when paying away the warps. Some improvement had been made on the Fairtry vessels by using special linings, but one British speaker thought that some tensioning system was desirable. A Norwegian discussed the use of regenerative braking, by which the winch drives its motor, which acts as a generator and applies braking effort. However,

this required specially designed worm gear, or better, bevel gear, which would take the reverse loads. Although hydraulics would act in this way, there was a danger of damage should a high pressure system be overspeeded. One speaker reported no trouble, probably due to slower shooting speeds. No mention was made of warp tensioning or metering devices, and the United States-type powered drum for winding on the trawl was criticized on the grounds that net repair and inspection was made difficult.

The conference ended with papers by the two White Fish Authority experts. One of the speakers suggested the need for designing now for the pattern of fisheries which we can expect in, say, 10 years' time. He had in mind the possibility of a greater protection of home grounds and greater exclusion from distant grounds, which could call for a more efficient inshore and near-water fleet. A number of "standard" designs were described, some of which had already been built in Norway. The other British expert discussed the relative merits of various engine arrangements, Diesel electric drive, and stern trawler specification generally.

In closing the meeting, the chairman of the White Fish Authority made an outspoken appeal to trawler owners, asking them to be less secretive and more ready to add their experience to the general pool of knowledge. (World Fishing, November 1963.)




Venezuela


NEW SHRIMP-PROCESSING PLANT:

A new Venezuelan shrimp-processing plant was opened on the west side of the Paraguaná Peninsula, northeast of Maracaibo, Venezuela, during the latter part of 1963. The plant capacity is not known. The new firm, which is associated with a Philadelphia fishery firm, plans to process and export shrimp to the United States. The plant is adjacent to the Gulf of Venezuela which, together with Lake Maracaibo, are the principal fishing areas of shrimp vessels operating in Venezuela. (United States Embassy, Caracas, December 24, 1963.)





FEDERAL ACTIONS



Department of Commerce

AREA REDEVELOPMENT ADMINISTRATION

WILLAPA BAY, WASHINGTON, OYSTER INDUSTRY STUDY APPROVED:

Improved techniques designed to increase the yield of marketable oysters from the Willapa Bay, Wash., area could result from a \$34,170 technical assistance study approved on December 17, 1963, by the Area Redevelopment Administration (ARA). Favorable results could lead to improvements in that industry creating new jobs during the oyster season, when large numbers of workers in logging operations are unemployed. Seasonal shifts between those two industries would be in the unskilled and semi-skilled categories which would not require retraining.

The ARA funds will be used by the Washington State Department of Fisheries for a one-year investigation of problems now blocking economic development in the industry. The three-part project will concentrate on ways to increase the meat yield of oysters, raise the nutrient level of beds through application of chemical fertilizers, and boost production of oyster seeds from local beds.

Willapa Bay is located in Pacific County which was designated as eligible to participate in the ARA program as a small area of persistent and substantial unemployment.



Department of Health, Education, and Welfare

FOOD AND DRUG ADMINISTRATION

PUBLIC HEARING ON STANDARDS OF IDENTITY FOR FROZEN RAW BREADED SHRIMP:

A notice of public hearing regarding establishment of definitions and standards of

identity for frozen raw breaded shrimp and frozen raw lightly breaded shrimp was announced by the Food and Drug Administration on December 18, 1963. The notice was published in the Federal Register of Saturday, December 21, 1963. The hearing was originally scheduled for January 20, 1964, at Washington, D. C., but was later postponed to February 17, and was to continue thereafter at such times and places as directed by the hearing examiner. All interested persons were invited to attend the hearing and present evidence.

The changes in hearing and prehearing conference dates were announced by the Food and Drug Administration on January 9 and published in the January 11, 1964 Federal Register.

A prehearing conference for the simplification of the issues, exchange of documentary evidence, the scheduling of witnesses, and such other matters was to be held on January 8, 1964, also in Washington, D. C. The prehearing date was later moved to February 7.

Pertinent sections of the notice of public hearing regarding establishment of definitions and standards of identity for frozen raw breaded shrimp and frozen raw lightly breaded shrimp as shown in the December 21, 1963, Federal Register follow:

A notice of proposed rulemaking was published in the FEDERAL REGISTER of March 31, 1961 (26 F.R. 2722), setting forth the joint petition of the National Fisheries Institute, Inc., 1614 Twentieth Street NW., Washington 9, D.C., and the National Shrimp Breaders Association, Inc., 624 South Michigan Avenue, Chicago 5, Illinois, for the establishment of a definition and standard of identity for frozen raw breaded shrimp. Based upon comments received from interested persons and other information available, an order by the Commissioner of Food and Drugs was published in the FEDERAL REGISTER of May 7, 1963 (28 F.R. 4556), promulgating definitions and standards of identity for frozen raw breaded shrimp (21 CFR 36.30) and fro-

on raw lightly breaded shrimp (21 CFR 36.31). Objections were filed to the order, and a public hearing was requested as provided in the Federal Food, Drug, and Cosmetic Act (sec. 701(e)(2), 70 Stat. 919; 21 U.S.C. 371(e)(2)). A notice was published on July 6, 1963 (38 F.R. 6915), announcing that objections had been filed and that the order was stayed pending a resolution of the issues at a public hearing.

The Commissioner of Food and Drugs has concluded that the objections state reasonable grounds for a hearing on the following issues:

1. Whether it will promote honesty and fair dealing in the interest of the consumer to require the following minimum amounts of shrimp material:

a. Fifty percent for frozen raw breaded shrimp (21 CFR 36.30) or should the minimum percentage be increased to sixty percent.

b. Seventy percent for frozen raw lightly breaded shrimp (21 CFR 36.31).

2. Whether it will promote honesty and fair dealing in the interest of the consumer, in the label declaration of the food and the optional ingredients, to:

a. Require that a prominent label declaration of optional ingredients shall immediately precede or follow the name of the food, without intervening written, printed, or graphic matter, wherever such name appears on the label so conspicuously as to be easily seen under customary conditions of purchase (21 CFR 36.30(f)).

b. Require the naming of composite units of shrimp (21 CFR 36.30(e)(6)) as "Breaded shrimp cutlets", if cutlet-shaped; "Breaded shrimp sticks", if stick-shaped; and if in a shape other than cutlet or stick, "Breaded shrimp _____", the blank to be filled in with the word or phrase that accurately describes the shape but is not misleading.

c. Permit the item consisting of units prepared from pieces or parts of shrimp to be designated as anything other than "Breaded shrimp pieces" (21 CFR 36.30(e)(5)).

d. Permit as an alternative designation for "Breaded round shrimp" (21 CFR 36.30(e)(3)) which have tail fins on, the designation "Breaded round fan-tail shrimp."

e. Require the size of the raw shrimp used to be listed on the label and to establish standards for size based on the

number of shrimp per pound, including a definition of size for prawns based on number of shrimp per pound.

f. Require the percentage of breading present to be listed on the label.

g. Require a designation of geographical origin of the raw shrimp.

3. Whether the regulation for the method of determining shrimp material should vary from that prescribed by the United States Department of the Interior in 50 CFR 262.21, specifically:

a. By providing for the use of a rubber-tipped glass stirring rod (21 CFR 36.30(g)(1)(ix)).

b. By the use of the term "+2" instead of "+5" in the formula for calculating the percent of shrimp matter (21 CFR 36.30(g)(2)(ii)).

4. Whether a provision should be added to the standards of identity limiting the time raw frozen shrimp may be held in storage prior to breading.

Objections were also received referring to absence of regulations for rules for inspections, regarding tolerances for and the handling of "out of grade" packs, and regarding the establishment of a standard of quality. It is the opinion of the Commissioner that these matters are not proper to be included in the proposed standards.

Note: See Commercial Fisheries Review, August 1963 p. 114; June 1963 p. 94.



U. S. Tariff Commission and U. S. Trade Information Committee

HEARINGS HELD ON SOME FISHERY PRODUCTS PRELIMINARY TO 1964 GATT NEGOTIATIONS:

The U. S. Tariff Commission and the U. S. Trade Information Committee began public hearings on December 2, 1963, to permit the United States industry to advise the Government of its interest in the General Agreement on Tariffs and Trade (GATT) negotiations scheduled to be held during 1964 in Geneva. The Tariff Commission scheduled the following organizations of the United States fisheries industry for oral appearances and testimony on December 11, 1963: Alaska Fishermen's Union; Association of Pacific Fisheries; American Tunaboat Association; Tuna Research Foundation; Maine Sardine Packers Association; Romanoff Caviar Company; and the Alaska King Crab Association.

The Tariff Commission is to advise the President as to the probable economic effects of possible tariff reductions on United States industries producing like or directly competitive articles. The public hearings were an important part of the Commission's investigation and collection of information.

Hearings by the Trade Information Committee (an inter-agency body chaired by a representative of the Office of Special Representative for Trade Negotiations), will cover all aspects of the tariff-swapping sessions, including the lowering of trade barriers on articles on the United States public list. The Committee hopes to be able to focus on determining which foreign tariffs and trade restrictions are most burdensome to United States exporters and should be reduced or eliminated in the interest of expanding United States exports.

The Notice of Investigation and Hearings was announced by the Tariff Commission on October 22, 1963, and published in the Federal Register of that date, as follows:

TARIFF COMMISSION

[TEA-221(b)-1]

PRESIDENT'S LIST OF ARTICLES FOR POSSIBLE CONSIDERATION IN TRADE AGREEMENT NEGOTIATIONS

Notice of Investigation and Hearings

1. Tariff Commission public hearings will begin on December 2, 1963.

2. The final date for filing requests to testify at the Tariff Commission public hearings is November 20, 1963.

On October 22, 1963, the President, pursuant to section 201(a) of the Trade Expansion Act of 1962 (hereinafter referred to as "the Act"), furnished the United States Tariff Commission there-

inafter referred to as "the Commission") a list of articles (hereinafter referred to as the "President's list") to be considered for modification or continuance of United States duties or other import restrictions, or continuance of United States duty-free or excise treatment, in connection with trade-agreement negotiations to be conducted under the Act. The President's list is published in the *FEDERAL REGISTER* concurrently with this notice.¹

I. Investigation instituted. In accordance with Part 205 of the Commission's rules of practice and procedure, the Commission has instituted an investigation for the purpose of obtaining, to the extent practicable, information of the kind described in section 221(c) of the Act for use in connection with the preparation of advice to the President required by section 221(b) of the Act, namely, advice with respect to each article included in the President's list of the Commission's judgment as to the probable economic effect of modifications of duties or other import restrictions on industries producing like or directly competitive articles.

II. Procedure for conduct of hearings and submission of written views. A. Public hearings in connection with the investigation will commence at 10:00 a.m. on Monday, the 2d day of December, 1963, in the Hearing Room, Tariff Commission Building, 8th and E Streets NW., Washington, D.C.

1. Requests to appear at the public hearings must be filed in writing with the Secretary of the Commission on or before November 20, 1963. Such requests must contain the following information:

a. The item number or numbers in the Tariff Schedules of the United States covering the article or articles on which testimony will be presented.

b. The name and organization of the witness or witnesses who will testify, and the name, address, telephone number, and organization of the person filing the request.

c. A statement indicating whether the testimony to be presented will be on behalf of importer or domestic-producer interests.

d. A careful estimate of the aggregate time desired for presentation of oral testimony by all witnesses for whose appearances the request is filed.

2. Allotment of time: Because of the extensive scope of the President's list, limitation of time for the presentation of oral testimony is in the public interest. Accordingly, in scheduling appearances at the hearings the time to be allotted to witnesses for the presentation of oral testimony will be limited as circumstances require. Supplemental written statements will be allowed in all cases, and should be submitted at the time of presentation of oral testimony.

3. Notification of date of appearance: Persons who have properly filed requests to appear will be individually notified in advance of the date on which they will be scheduled to present oral testimony and of the time allotted for presentation of such testimony.

4. Order of hearings: To the extent practicable the hearings will follow the order of the Tariff Schedules of the United States, beginning with Schedule 1. **Animal and Vegetable Products.**

¹ See Presidential Notice of October 31, 1963, *supra*.

5. Questioning of witnesses will be limited to members of the Commission.

B. Written information and views in lieu of appearance at the public hearings may be submitted by interested persons. A signed original and nineteen true copies of such statements shall be submitted. Business data which it is desired shall be treated as confidential shall be submitted on separate sheets, each clearly marked at the top "Business Confidential." All written statements, except for confidential business data, will be made available for inspection by interested persons. To be assured of consideration by the Commission, written statements in lieu of appearance should be submitted at the earliest practicable date, but not later than the date of the closing of the public hearings.

III. Requests for reservation of certain items from negotiations. Under conditions set forth in section 225(b) of the Act, certain articles included in the President's list must be reserved by the President from negotiation for the reduction of duty or other import restriction or the elimination of duty. This reservation provision applies to any article with respect to which (1) the Commission, in escape-clause proceedings concluded prior to October 11, 1962, found by majority vote that it was being imported in such increased quantities as to cause or threaten serious injury to an industry, (2) there was not in effect on October 11, 1962, any action taken under section 7 of the Trade Agreements Extension Act of 1951, (3) a request in behalf of the industry concerned is filed with the Commission not later than 60 days after publication of the President's list, and (4) the Commission finds and advises the President that economic conditions in such industry have not substantially improved since the date of the report of the finding referred to in (1).

A. Articles subject to request for reservation under section 225(b) of the Act are listed in the Annex to this notice.

B. Requests for reservation may be filed by or on behalf of any firm or firms which in 1962 accounted for more than 50 percent of the production (by quantity) of the domestic article concerned in an escape-clause investigation finding of serious injury or the threat thereof. Interested persons who intend filing requests are urged to do so within the time specified in part II A 1 for the filing of requests to appear at the public hearings in connection with the President's list. Persons doing so will be allowed additional time for the presentation of evidence at the hearings. (Note § 205.9 of the Commission's rules of practice and procedure (19 CFR 205.9) which provides that investigations for the purposes of section 225(b) of the Act will be consolidated with the investigation for the purposes of section 221 of the Act.)

C. Requirements for requests. Requests for reservation shall include the following: (1) The names and addresses of the firms known by the persons filing the request to be producing the domestic article concerned, and the location of the separate establishments, if any, of such firms in which such article is produced; (2) data on production by quantity of the domestic article concerned for each of the years 1958 through 1962; and (3) a statement of the facts form-

ANNEX—ARTICLES REFERRED TO IN PART III OF TARIFF COMMISSION NOTICE

[NOTE: "TSUS" refers to "Tariff Schedules of the United States"; "pt" after an item number means that only part of the item is involved.]

TSUS Item No.	Articles	Number and date of Tariff Commission report
110.50 110.55	Cod, cusk, haddock, hake, pollock, and Atlantic ocean perch (rosefish), "otherwise processed".	7-47 10/12/59
126.23	Alfalfa clover seed.	1-10401-2 5/9/57
136.30	Garlic.	17-21 8/1/56
186.20	Fur, not on the skin, prepared for hatiers' use, and carotined furskins.	17-21 8/1/56
246.15 246.20 246.22 246.24	Velveteens, of cotton.	7-49 10/24/58
373.65 (pt)	Screen-printed scarves, of silk.	7-19 4/12/53
435.94	Tartaric acid.	7-49
426.76	Cream of tartar.	7-70
532.21 (pt)	Ceramic mosaic tiles (except such tiles valued at 95 cents or more per square foot, and except tiles in sheets (1) consisting over 300 tiles per square foot, or (2) having cone, or not more than half, of the tiles with faces which (disregarding rounded corners) are in the form of triangles, rectangles, or polygons and with such triangles, rectangles, or polygons as there may be forming an integral part of the pattern).	7-108 4/10/51
696.91	Scissors and shears and blades therefor, valued over \$1.75 per dozen.	7-94 3/12/54
723.04 (pt)	Violins and violas valued not over \$25 each.	7-55 1/20/57
732.02 732.04 732.06 732.10 732.12 732.14 732.16 732.18 732.20 732.22 732.24	Bicycles.	7-57 3/14/55
734.55 (pt)	Baseball (including softball) gloves and mitts.	7-97 4/2/51
745.52	Dressmakers' or common pins.	7-25 1/20/57
751.20 (pt) 751.25 (pt)	Ribs and stretchers of metal for umbrellas or parasols of the kind commonly carried by hand when in use, in frames or otherwise, and tubes (rods) for such umbrellas, whether or not of metal.	7-62 1/14/58
754.35 (pt)	Ferrocerium and other cerium alloys.	7-41 12/24/56
766.20 (pt)	Tobacco pipes and pipe bowls, of briar wood or root, valued not over \$5 per dozen.	7-10 12/22/53
790.05	Spring type clothespins.	7-57 9/10/57

ing the basis of the claim that economic conditions in the industry producing the domestic article concerned have not improved since the date of the report of the Commission which contained the finding of serious injury or the threat thereof.

IV. Related hearings before the Trade Information Committee. Published in the *FEDERAL REGISTER* concurrently with this notice is an announcement by the Trade Information Committee¹ regarding public hearings to be held by the Committee on the articles included in the President's list, and on other matters, to begin on December 2, 1963. Oral testimony and written statements of interested persons received by the Commission in connection with its investigation for the purposes of section 221 of the Act will be made available by the

¹ See F.R. Doc. 63-11183, in Notices section, *supra*.

Commission to the Trade Information Committee. Accordingly, as stated in the Trade Information Committee's notice, appearance before the Trade Information Committee for the purpose of submitting the same information, although permissible, will not be necessary.

V. Communications to be addressed to Secretary. All communications regarding the Commission's investigation should be addressed to the Secretary, United States Tariff Commission, Washington, D.C., 20436.

Issued October 22, 1963.

By direction of the United States Tariff Commission.

[SEAL]

DONN N. BENT,
Secretary.



U. S. Tariff Commission

HEARINGS ON EXCLUSION OF GROUNDFISH AND OCEAN PERCH FILLETS FROM TARIFF MODIFICATION:

The U. S. Tariff Commission on December 23, 1963, announced hearings for January 28, 1964, to determine whether or not groundfish and ocean perch fillets (cod, cusk, haddock, hake, pollock, and Atlantic ocean perch, under Tariff Schedules of the United States Item Nos. 110.50 and 110.55) will be eligible for exclusion from the President's list of articles up for tariff modification in the forthcoming trade negotiations under the General Agreement on Tariffs and Trade.

The Notice of Investigations and Hearings announced by the Tariff Commission on December 26, was published in the Federal Register of December 27, 1963.

Note: Earlier, on December 11, 1963, fishing industry representatives appeared before the U. S. Tariff Commission and the Trade Information Committee to give testimony as to why their products should or should not be included on the negotiating list for possible tariff reductions which the United States will take to the GATT conference scheduled to open in Geneva in May 1964.



Department of the Treasury

HALIBUT STEAKS FROM JAPAN NOT BEING SOLD AT LESS THAN FAIR VALUE:

A determination that halibut steaks from Japan are not being, nor likely to be, sold in the United States at less than fair value within the meaning of section 201 (a) of the Anti-dumping Act, 1921, as amended (19 U. S. C. 160 (a)), was announced by the U. S. Depart-

ment of the Treasury on December 12, 1963. The statement of reasons as published in the Federal Register of December 27, 1963, follows:

Statement of reasons: The imported product is halibut steak. The quantity of halibut steaks sold for home consumption is inconsequential. Dressed halibut, however, is sold for home consumption. The dressed halibut is deemed to be similar to halibut steaks within the meaning of the Antidumping Act. The quantity of dressed halibut sold for home consumption was sufficient to furnish a basis for a fair value comparison.

There is no relationship between the seller and the purchaser in the United States within the meaning of section 207 of the Antidumping Act.

The appropriate comparison for fair value purposes, therefore, is between purchase price and adjusted home market price.

Purchase price was computed by deducting inland freight and shipping charges from the f.o.b. Japanese port price.

Adjusted home market price was computed by adding to the price of dressed halibut in the home market, the cost of processing it into steaks. The proceeds from the sale of certain by-product wastes produced in the manufacture of the steak were deducted. An addition was made to reflect the additional cost resulting from the fact that the halibut steak yield was less than 100 percent of the dressed halibut. The extra cost of export packing was also added.

Purchase price was found to be not lower than adjusted home market price.

The determination was the result of a complaint received by the Treasury Department that halibut steaks from Japan were being sold in the United States at less than fair value within the meaning of the Antidumping Act of 1921.

PUBLIC HEARING HELD ON ANTIDUMPING REGULATIONS:

A public hearing on Treasury Department regulations (19 CFR 14.6-14.13) now in effect under the Antidumping Act (19 U. S. C. 160-173) was held on January 23, 1964, at Washington, D. C.

The Notice of Hearing dated December 19, 1963, that the Treasury Department is presently reviewing its regulations on the Antidumping Act was published in the Federal Register of December 24, 1963.



Eighty-Eighth Congress (First and Second Sessions)

CONGRESS ADJOURNS: After the longest session in 20 years, the first session of the 88th Congress adjourned sine die on Dec. 30, 1963. The second session of this Congress will convene on Jan. 7, 1964. All pending legislation before either the Senate or House will retain its status as of adjournment and will be subject to further consideration in the second session. Bills introduced in the first session do not have to be reintroduced. Bills that were reported out of a committee or passed by one body of the Congress remain in status quo and do not have to again retrace their legislative steps.



CONGRESS RECONVENES: The second session of the 88th Congress convened on Jan. 7, 1964.

FOOD-FOR-PEACE, AND FISH: The President on Dec. 16, 1963, signed H. R. 7885, an act to amend further the Foreign Assistance Act of 1961 (P. L. 88-205). Included in this law is a provision for the inclusion of domestically-produced fishery products under Public Law 480 (Sec. 403 (c)). This would amend section 106 of the Agricultural Trade Development and Assistance Act of 1954 (P. L. 480) to include, in title I and title IV programs, any domestically-produced fishery product if the Secretary of the Interior determines that the product at the time of export is excess of domestic requirements, adequate carry-over, and anticipated exports for dollars. Fish flour (fish protein concentrate) will not be included until approved by the Food and Drug Administration. The amendment with respect to title I will not become effective until Jan. 1, 1965.

IMPORT COMMODITY LABELING: The President on Jan. 1, 1964, vetoed H. R. 2513, to amend the Tariff Act of 1930 to require certain new packages of imported articles to be marked to indicate the country of origin, and for other purposes. In a statement explaining his veto of the labeling measure, the President said it would: (1) "Raise new barriers to foreign trade and invite retaliation against our exports at a time when we are trying to expand our trade and improve Western unity; (2) "Impose new costs on merchants and consumers; (3) "Saddle new and unworkable burdens upon our Bureau of Customs at a time when we are trying to reduce Government expenditures. . . ." The President also stated "there is no need for this bill" because the Federal Trade Commission already has authority to require disclosure of the foreign origin of articles offered for sale in this country whenever "there may be danger of deception of the purchaser." The President's statement appeared in the Congressional Record of Jan. 7, 1964, pp. 5 and 6.

NORTH PACIFIC FUR SEAL CONVENTION: On Jan. 16, 1964, Senator Fulbright (Arkansas) announced

from the floor of the Senate that hearings would be held by the Committee on Foreign Relations on Jan. 21, 1964, concerning the protocol amending the North Pacific Fur Seal Convention.

PRICE-QUALITY STABILIZATION: The Special Subcommittee of the Senate Committee on Commerce will resume hearings on Jan. 22 and 23, 1964, on S. 774, to amend the Federal Trade Commission Act, to promote quality and price stabilization, to define and restrain certain unfair methods of distribution, and to confirm, define and equalize the rights of producers and resellers in the distribution of goods identified by distinguishing brands, names, or trademarks, and for other purposes.

RUSSIAN TRAFFIC IN UNITED STATES TERRITORIAL WATERS: Russian Trawler Traffic in United States Territorial Waters (Hearings before the Subcommittee for Special Investigations of the Committee on Armed Services, House of Representatives, 88th Congress, 1st Session), 129 pp., printed. Contains hearings held July 9 and 10, 1963, on Russian trawler traffic in territorial waters of the United States, particularly on the coast of Florida; and testimony or statements of various Government officials and members of Congress.

SHELLFISH INDUSTRY PROBLEMS: Molluscan Shellfish (Hearings before the Subcommittee on Fisheries and Wildlife Conservation of the Committee on Merchant and Marine and Fisheries, House of Representatives, 88th Congress, 1st Session), 234 pp., printed. Contains hearings held Oct. 2 and 3, 1963, to consider the problems confronting the oyster industry and to appraise all the problems besetting the molluscan shellfish industry. Also contains the statements or testimony of various Government agencies, state governments, and industry people.

SMALL BUSINESS DISASTER LOANS: The House on Jan. 16, 1964, received the report (H. Rept. 1097) from the Committee on Banking and Currency on S. 1309, to amend the Small Business Act to increase the revolving fund and broaden disaster loan authority. The bill, which was passed by the Senate on Nov. 21, 1963, contains an amendment which would provide disaster loans to firms which have "suffered substantial economic injury as a result of the inability of such concern to process or market a product for human consumption because of disease of toxicity occurring in such a product through natural or undertermined causes."

STATE DEPARTMENT APPROPRIATIONS FY 1964: Departments of State, Justice, and Commerce, the Judiciary, and Related Agencies Appropriations, 1964 (Hearings before the Subcommittee of the Committee on Appropriations, United States Senate, 88th Congress, 1st Session), 1,208 pp., printed. Contains hearings held on H. R. 7063, making appropriations for the Departments of State, Justice, and Commerce, the Judiciary, and Related Agencies for the fiscal year ending June 30, 1964, and for other purposes. Included in the funds for the Department of State are appropriations for the International Fisheries Commissions.

H. R. 7063, was passed by the House June 18, 1963, and by the Senate, with amendments, Dec. 12, 1963.

S. Rept. 747, Departments of State, Justice, and Commerce, the Judiciary, and Related Agencies Appropriation Bill, 1964 (Dec. 5, 1963, Report from the

Committee on Appropriations, United States Senate, 88th Congress, 1st Session), 35 pp., printed. Contains the report of the Committee and the various amendments.

A conference on H. R. 7063 by the Committee of Conference was held on Dec. 17, 1963, and was reported (H. Rept. 1056) to the respective Houses on the same date.

H. Rept. 1056, Departments of State, Justice, and Commerce, the Judiciary, and Related Agencies Appropriation Bill, 1964 (Dec. 17, 1963, a Conference Report from the Committee of Conference, House of Representatives, 88th Congress, 1st Session, to accompany H. R. 7063), 7 pp., printed. The Committee of Conference came to agreement and presented their recommendations to the respective Houses. Included in the appropriations for the Department of State are funds for the International Fisheries Commissions for which the Committee of Conference recommended \$2,000,000, an increase of \$90,000 over the amount approved in FY 1963, but \$53,000 less than the amount requested by the State Department. The allocations for the Commissions are shown in the tabulation.

	Requested FY 1964	Approved FY 1964	Approved FY 1963
Inter-American Tropical Tuna...	399,000	392,100	354,000
International Pacific Halibut...	194,350	187,100	355,300
International Pacific Salmon...	363,000	344,500	241,900
Northwest Atlantic Fisheries...	6,000	6,000	6,000
International Whaling.....	900	900	900
North Pacific Fisheries.....	24,800	24,800	19,000
Great Lakes Fisheries.....	1,051,050	1,030,700	919,000
North Pacific Fur Seal.....	1,900	1,900	1,900
Expenses, U. S. Commissioners.	12,000	12,000	12,000
Total.....	\$2,053,000	\$2,000,000	\$1,910,000

The Senate and the House agreed to the Conference Report Dec. 18, 1963. The President on Dec. 30, 1963, signed H. R. 7063 into Public Law 88-245.

SUGGESTED CHANGES INVITED IN TARIFF SCHEDULES OF UNITED STATES OF AUGUST 31, 1963: The Chairman of the Committee on Ways and Means, House of Representatives, on December 13, 1963, announced that the Committee had invited interested persons and groups to submit, in writing, to the Committee suggested revisions and changes in the Tariff Schedules of the United States (TSUS) which became effective August 31, 1963.

The suggested changes and revisions were to be limited to those provisions of the TSUS wherein it appears that through (1) oversight or inadvertence or (2) lack of information, errors have been made or clarifying language may be necessary.

The suggested changes and revisions were not to include matters which were timely presented to the Tariff Commission in connection with their Customs Simplification Study and were considered by the Commission, unless the factors in the paragraph above were involved. The suggested changes were also not to include matters presented to the Committee on Ways and Means when the proposed new tariff schedules were being formulated in 1961.

The Chairman stated that the purpose of the written statements would be to enable the Committee on Ways and Means to determine whether or not certain changes and revisions should be made where there have been errors, inadvertences, or a lack of sufficient information at the time the schedules were adopted by the Congress.



Created in 1849, the Department of the Interior—America's Department of Natural Resources—is concerned with the management, conservation, and development of the Nation's water, fish, wildlife, mineral, forest, and park and recreational resources. It also has major responsibilities for Indian and Territorial affairs.

As the Nation's principal conservation agency, the Department works to assure that nonrenewable resources are developed and used wisely, that park and recreational resources are conserved for the future, and that renewable resources make their full contribution to the progress, prosperity, and security of the United States—now and in the future.

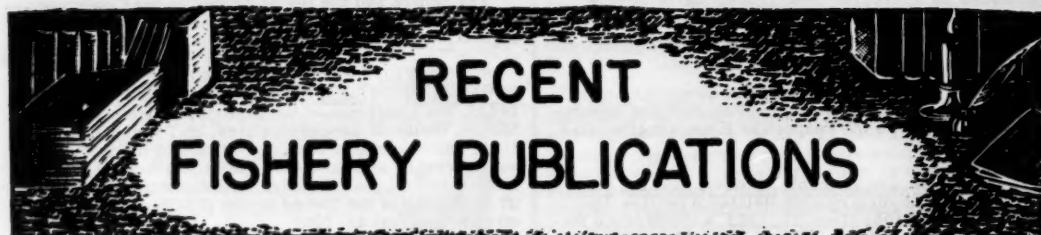
Editorial Assistants: Ruth V. Keefe and Jean Zalevsky

Sr. Composer: Alma Greene

Jr. Composers: Donna K. Wallace and Marjorie McGlone

Photograph Credits: Page by page, the following list gives the source or photographer for each photograph in this issue. Photographs on pages not mentioned were obtained from the Service's file and the photographers are unknown.

P. 16--U. S. Naval Oceanographic.



RECENT FISHERY PUBLICATIONS

FISH AND WILDLIFE SERVICE PUBLICATIONS

THESE PROCESSED PUBLICATIONS ARE AVAILABLE FREE FROM THE OFFICE OF INFORMATION, U. S. FISH AND WILDLIFE SERVICE, WASHINGTON, D. C. 20240. TYPES OF PUBLICATIONS ARE DESIGNATED AS FOLLOWS:

CFS - CURRENT FISHERY STATISTICS OF THE UNITED STATES.

FL - FISHERY LEAFLETS.

MNL - REPRINTS OF REPORTS ON FOREIGN FISHERIES.

SEP. - SEPARATES (REPRINTS) FROM COMMERCIAL FISHERIES REVIEW.

SL - STATISTICAL LISTS OF DEALERS IN AND PRODUCERS OF FISHERY PRODUCTS AND BYPRODUCTS.

SSR.- FISH.- SPECIAL SCIENTIFIC REPORTS--FISHERIES (LIMITED DISTRIBUTION).

- | Number | Title |
|----------|---|
| CFS-3214 | - Shrimp Landings, November 1962, 8 pp. |
| CFS-3258 | - Massachusetts Landings, March 1963, 7 pp. |
| CFS-3259 | - Massachusetts Landings, April 1963, 7 pp. |
| CFS-3309 | - Texas Landings, 1962 Annual Summary, 6 pp. |
| CFS-3320 | - Frozen Fishery Products, September 1963, 8 pp. |
| CFS-3325 | - Great Lakes Fisheries, 1962 Annual Summary, 9 pp. |
| CFS-3332 | - Fish Sticks and Fish Portions, July-September 1963, 2 pp. |
| CFS-3333 | - Maryland Landings, August 1963, 4 pp. |
| CFS-3334 | - Virginia Landings, August 1963, 4 pp. |
| CFS-3335 | - Louisiana Landings, August 1963, 3 pp. |
| CFS-3336 | - Georgia Landings, September 1963, 3 pp. |
| CFS-3337 | - North Carolina Landings, September 1963, 4 pp. |
| CFS-3338 | - Michigan Landings, July 1963, 3 pp. |
| CFS-3339 | - Mississippi Landings, August 1963, 3 pp. |
| CFS-3341 | - South Carolina Landings, September 1963, 3 pp. |
| CFS-3342 | - Texas Landings, April 1963, 3 pp. |
| CFS-3343 | - Texas Landings, May 1963, 3 pp. |
| CFS-3347 | - Rhode Island Landings, August 1963, 3 pp. |
| CFS-3348 | - Maine Landings, August 1963, 4 pp. |
| CFS-3349 | - Fish Meal and Oil, September 1963, 2 pp. |
| CFS-3350 | - Florida Landings, September 1963, 8 pp. |
| CFS-3351 | - Michigan Landings, August 1963, 3 pp. |
| CFS-3353 | - Chesapeake Fisheries, 1962 Annual Summary, 7 pp. |
| CFS-3354 | - Maryland Landings, September 1963, 4 pp. |
| CFS-3355 | - Ohio Landings, August 1963, 3 pp. |
| CFS-3359 | - Alabama Landings, August 1963, 4 pp. |
| CFS-3364 | - Shrimp Landings, July 1963, 7 pp. |

Wholesale Dealers in Fishery Products (Mississippi River and Tributaries), 1962 (Revised):

SL-32 - Minnesota, 2 pp.

SL-36 - Iowa, 2 pp.

Sep. No. 698 - Mechanizing the Blue Crab Industry - Part III - Strengthening the Industry's Economic Position.

Sep. No. 699 - Foreign Fisheries Briefs.

FL-455 - Blue Sac Disease of Fish (Also Known as Dropsy, Yolk Sac Disease and Hydrocoele Embryonalis), by Ken Wolf, 5 pp., illus., revised May 1963.

FL-553 - Delicatessen Fish Products, by Norman D. Jarvis, 7 pp., illus., printed, August 1963. Presents recipes for the preparation of large quantities of fish salads, fish and crab cakes, marinated salmon, and other fish dishes.

FL-556 - Saltonstall-Kennedy Act, as Amended (an excerpt from Title 15 of the United States Code), 4 pp., September 1963. Contains Sec. 713c-3. Provides for the promotion of the free flow of domestically-produced fishery products.

FL-557 - Fish and Wildlife Act of 1956, as Amended (an excerpt from Title 16 of the United States Code), 10 pp., September 1963.

SSR-Fish. No. 414 - Zooplankton Volumes Off the Pacific Coast, 1959, by James R. Thrailkill, 79 pp., illus., processed, April 1963.

SSR-Fish. No. 447 - The Spiny Dogfish (*Squalus acanthias*) in the Northeastern Pacific, by Dayton L. Alverson and Maurice E. Stansby, 28 pp., illus., processed, July 1963.

SSR-Fish. No. 465 - Stream Catalog of Southeastern Alaska, Regulatory Districts Nos. 3 and 4, edited by Russell F. Orrell, Carl Rosier, and Lyle R. Simpson, 239 pp., illus., processed, August 1963.

Index of Fishery Biological Papers by U. S. Fish and Wildlife Service Authors Appearing in Nongovernmental Publications, 1940-56, by Lola T. Dees, Circular 151, 140 pp., illus., 1963.

Let's Get Hot with Cool Tuna, Load Up on These Hot Selling Tips for Cool Cash Returns, Special Fisheries Marketing Bulletin, 2 pp., illus., 1963.

Quick Cool Tuna for Long Hot Summer, Take It Easy with Tuna, Special Fisheries Marketing Bulletin, 2 pp., illus., 1963.

THE FOLLOWING MARKET NEWS LEAFLETS ARE AVAILABLE FROM THE FISHERY MARKET NEWS SERVICE, U. S. BUREAU OF COMMERCIAL FISHERIES, WYATT BLDG., SUITE 611, 777 14TH ST. NW., WASHINGTON, D. C. 20005.

Number	Title
MNL-10	- Swedish Fisheries, 1962/63, 13 pp.
MNL-12	- Major Developments in Peru's Fishing Industry, 1962/63, 19 pp.
MNL-13	- India's Fishing Industry, 1962, 23 pp.
MNL-85	- Iran's Fishing Industry, 1963, 9 pp.
MNL-86	- Hong Kong Fishing Industry, 1962/63, 22 pp.

THE FOLLOWING PUBLICATIONS ARE AVAILABLE ONLY FROM THE SPECIFIC OFFICE MENTIONED.

(Baltimore) Monthly Summary--Fishery Products, September 1963, 8 pp. (Market News Service, U. S. Fish and Wildlife Service, 103 S. Gay St., Baltimore, Md. 21202.) Receipts of fresh- and salt-water fish and shellfish at Baltimore by species and by states and provinces; total receipts by species and comparisons with previous periods; and wholesale prices for fresh fishery products on the Baltimore market; for the month indicated.

California Fishery Market News Monthly Summary, Part I - Fishery Products Production and Market Data, October and November 1963, 18 pp. each. (Market News Service, U. S. Fish and Wildlife Service, Post Office Bldg., San Pedro, Calif. 90731.) California cannery receipts of tuna and tunalike fish and other species used for canning; pack of canned tuna, tunalike fish, mackerel, and anchovies; market fish receipts at San Pedro, Santa Monica, and Eureka areas; California and Arizona imports; canned fish and frozen shrimp prices; ex-vessel prices for cannery fish; for the months indicated.

California Fishery Market News Monthly Summary, Part II - Fishing Information, November 1963, 8 pp., illus. (U. S. Bureau of Commercial Fisheries, Biological Laboratory, P. O. Box 6121, Pt. Loma Station, San Diego 6, Calif.) Contains sea-surface temperatures, fishing and research information of interest to the West Coast tuna-fishing industry and marine scientists; for the month indicated.

(Chicago) Monthly Summary of Chicago's Wholesale Market Fresh and Frozen Fishery Products Receipts, Prices, and Trends, October 1963, 13 pp. (Market News Service, U. S. Fish and Wildlife Service, U. S. Customs House, 610 S. Canal St., Rm. 1014, Chicago, Ill. 60607.) Receipts at Chicago by species and by states and provinces for fresh- and salt-water fish and shellfish; and weekly wholesale prices for fresh and frozen fishery products; for the month indicated.

Gulf of Mexico Monthly Landings, Production and Shipments of Fishery Products, October 1963, 8 pp. (Market News Service, U. S. Fish and Wildlife Service, Rm. 609, 600 South St., New Orleans, La. 70130.) Gulf States shrimp, oyster, finfish, and blue crab landings; crab meat production; LCL express shipments from New Orleans; wholesale prices of fish and shellfish on the New Orleans French Market; fishery imports at Port Isabel and Brownsville, Texas, from Mexico; Gulf menhaden landings and production of meal, solubles, and oil; and sponge sales; for the month indicated.

New England Fisheries--Monthly Summary, November 1963, 21 pp. (Market News Service, U. S. Fish and Wildlife Service, 10 Commonwealth Pier, Boston, Mass. 02210.) Review of the principal New England fishery ports. Presents data on fishery landings by ports and species; industrial-fish landings and ex-vessel prices; imports; cold-storage stocks of fishery products in New England warehouses; fishery landings and ex-vessel prices for ports in Massachusetts (Boston, Gloucester, New Bedford, Provincetown, and Woods Hole), Maine (Portland and Rockland), Rhode Island (Point Judith), and Connecticut (Stonington); frozen fishery products prices to primary wholesalers at Boston, Gloucester, and New Bedford; and Boston Fish Pier and Atlantic Avenue fishery landings and ex-vessel prices by species; for the month indicated.

New York City's Wholesale Fishery Trade--Monthly Summary--October 1963, 19 pp. (Market News Service, U. S. Fish and Wildlife Service, 155 John St., New York, N. Y. 10038.) Includes summaries and analyses of receipts and prices on wholesale Fulton Fish Market, including both the salt- and fresh-water sections; imports entered at New York customs district; primary wholesalers' selling prices for fresh, frozen, and selected canned fishery products; marketing trends; and landings at Fulton Fish Market docks; for the month indicated.

Pacific Game Fishing Atlas, by James L. Squire, Circular 174, 28 pp., illus., printed, 1963. (Tiburon Marine Laboratory, U. S. Bureau of Sport Fisheries and Wildlife, P. O. Box 98, Tiburon, Calif. 94920.) A synoptic presentation of the most important marine fishing areas in California, Oregon, Washington, Alaska, and Hawaii. In addition to locating areas for the different kinds of game fish, the locations of surf fishing areas, kelp beds, artificial reefs, fishing piers and barges, ramps, and charter boat and rental skiffs are pinpointed.

Halibut and Troll Salmon Landings, and Ex-Vessel Prices for Seattle, Alaska Ports and British Columbia, 1963-1962, 35 pp., December 1963. (Market News Service, U. S. Fish and Wildlife Service, 706 Federal Office Bldg., Seattle, Wash. 98104.) Gives landings and ex-vessel prices of troll salmon and halibut at leading United States ports of the Pacific Coast; ex-vessel halibut prices and landings at leading British Columbia ports; United States and Canadian Pacific Coast halibut landings, 1936-1963; Seattle season averages of ex-vessel halibut prices, 1954-1963; and troll salmon landings and receipts at Seattle and Alaska ports, with comparative data.

(Seattle) Washington and Alaska Receipts and Landings of Fishery Products for Selected Areas and Fisheries, Monthly Summary, November 1963, 8 pp. (Market News Service, U. S. Fish and Wildlife Service, 706 Federal Office Bldg., 909 First Ave., Seattle, Wash. 98104.) Includes Seattle's landings by the halibut and salmon fleets reported through the exchanges; landings of halibut reported by the International Pacific Halibut Commission; landings of otter-trawl vessels as reported by the Fishermen's Marketing Association of Washington; local landings by independent vessels; coastwise shipments from Alaska by scheduled and non-scheduled shipping lines and airways; imports from British Columbia via rail, motor truck, shipping lines, and ex-vessel landings; and imports from other countries through Washington customs district; for the month indicated.

MISCELLANEOUS PUBLICATIONS

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM. CORRESPONDENCE REGARDING PUBLICATIONS THAT FOLLOW SHOULD BE ADDRESSED TO THE RESPECTIVE ORGANIZATIONS OR PUBLISHER MENTIONED. DATA ON PRICES, IF READILY AVAILABLE, ARE SHOWN.

ADDITIVES:

Specifications for Identity and Purity of Food Additives. Vol. 1--Antimicrobial Preservatives and Antioxidants, printed, 1962. Food and Agriculture Organization of the United Nations, Viale delle Terme di Caracalla, Rome, Italy.

ALASKA:

1962 Alaska Commercial Fisheries Catch and Production Statistics, by P. E. Chitwood, Statistical Leaflet No. 5, 19 pp., printed, 1963. Alaska Department of Fish and Game, Support Bldg., Juneau, Alaska.

ALGAE:

"Antibiotic Activity of Some Marine Algae of Puerto Rico," by P. R. Burkholder, L. M. Burkholder, and L. R. Almondovar, article, *Botanica Marina*, vol. 2, no. 1/2, 1960, pp. 149-156, printed in English with German and French summaries. Studiengesellschaft zur Erforschung von Meeresalgen, e.V. Hamburg, Germany.

"How to Fight Algae," by William S. Service, Jr., article, *Aquarium Journal*, vol. XXXIV, no. 9, September 1963, pp. 387-388, 390, printed. San Francisco Aquarium Society, Inc., Steinhart Aquarium, Golden Gate Park, San Francisco 18, Calif.

"The Protein Quality, Digestibility, and Composition of Algae, *Chlorella* 71105," by Joseph A. Lubitz, article, *Journal of Food Science*, vol. 28, March-April 1963, pp. 229-232, printed. Institute of Food Technologists, 510-522 N. Hickory St., Champaign, Ill.

ANCHOVY:

La Pesca de la Anchoveta--Estadística de Pesca y Esfuerzo en Abril, Mayo y Junio de 1962 (The Anchovy Fishery--Statistics of the Fishery and Fishing Effort in April, May, and June 1962), by W. F. Doucet, G. Saetersdal, and I. Vasquez A., Report No. 5, 11 pp., illus., processed in Spanish, 1962. Library, Instituto de Investigación de los Recursos Marinos, P. O. Box 3734, Lima, Peru.

La Pesca de la Anchoveta--Estadística de Pesca y Esfuerzo en Enero, Febrero y Marzo de 1962 (The Anchovy Fishery--Statistics of the Fishery and Fishing Effort in January, February, and March 1962), by W. F. Doucet, G. Saetersdal, and I. Vasquez A., Report No. 2, 11 pp., illus., processed in Spanish, 1962. Library, Instituto de Investigación de los Recursos Marinos, P. O. Box 3734, Lima, Peru.

La Pesca de la Anchoveta--Estadística de Pesca y Esfuerzo en Octubre, Noviembre y Diciembre de 1961 (The Anchovy Fishery--Statistics of the Fishery and Fishing Effort in October, November, December 1961), by W. F. Doucet, G. Saetersdal, and I. Vasquez A., Report No. 1, 14 pp., illus., processed in Spanish, 1962. Library, Instituto de Investigación de los Recursos Marinos, P. O. Box 3734, Lima, Peru.

Synopsis of Biological Data on Anchovy, ENGRAULIS ENCRASICOLUS (Linnaeus), 1758 (Mediterranean and Adjacent Seas), by N. Demir, FAO Fisheries Synopsis No. 26, 43 pp., illus., processed, February 1963. Fisheries Division, Food and Agriculture Organization of the United Nations, Viale delle Terme di Caracalla, Rome, Italy.

ANIMAL NUTRITION:

Nutrition of Pigs and Poultry (Proceedings of the University of Nottingham Eighth Easter School in Agricultural Science), edited by J. T. Morgan and D. Lewis, 375 pp., printed, 70s. (about US\$9.80). Butterworth and Co. (Publishers) Ltd., Bell Yard, Temple Bar, London WC2, England, 1962.

ANTARCTIC:

"Pelagic Gadoid Fish in the Antarctic," by N. R. Merrett, article, *Norsk Hvalfangst-Tidende* (The Norwegian Whaling Gazette), vol. 52, no. 9, September 1963, pp. 245-247, illus., printed. Hvalfangerforeningen, Sandefjord, Norway.

ANTIOXIDANTS:

"Evaluation of Antioxidants by a Rapid Polarographic Method," by J. W. Hamilton and A. L. Tappel, article, *Journal of the American Oil Chemists' Society*, vol. 40, February 1963, pp. 52-54, printed. American Oil Chemists' Society, 35 E. Wacker Dr., Chicago 1, Ill.

AQUATIC WEEDS:

Aquatic Weeds; Their Identification and Methods of Control, by A. C. Lopinot, *Fisheries Bulletin* No. 4, 47 pp., printed, 1963. Illinois Department of Conservation, Springfield, Ill.

"Biological Controls for Water-Weeds," by Roy A. Grizzell, Jr. and William W. Neely, article, *Transactions of the Twenty-Seventh North American Wildlife and Natural Resources Conference*, pp. 107-113, printed. Wildlife Management Institute, Wire Bldg., Washington 5, D. C., 1962.

"The Grip of the Water Hyacinth," by A. D. Evans, article, *New Scientist*, vol. 19, no. 358, September 26, 1963, pp. 666-668, illus., printed. Cromwell House, Fulwood Pl., High Holborn, London WC1, England. Abnormal growth of water weeds can interfere with fishing, seriously reduce fish populations by deoxygenating the water and blocking the spawning grounds, and lead to increased populations of disease-carrying water snails. A native of Brazil, the water hyacinth now threatens many rivers in Africa and Asia.

AUSTRALIA:

Coastal Hydrological Investigations in the New South Wales Tuna Fishing Area, 1963, by A. D. Crooks, *Oceanographical Station List*, vol. 53, 84 pp., illus., processed, 1963. Division of Fisheries and Oceanography, Commonwealth Scientific and Industrial Research Organization, Melbourne, Australia.

Coastal Investigations at Port Hacking, New South Wales, 1960, by A. D. Crooks, *Oceanographical Station List*, vol. 52, 137 pp., processed, 1963. Division of Fisheries and Oceanography, Commonwealth Scientific and Industrial Research Organization, Melbourne, Australia.

Establishing a Business in Australia, OBR 63-108, 16 pp., printed. Bureau of International Commerce,

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

U. S. Department of Commerce, Washington, D. C., 1963. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.) Discusses Government policies on investment, external capital, and aiding industry; expropriation and compensation; land tenure regulations; rights of aliens; regulations governing entry and repatriation of capital; tariff policy; and laws regarding the various types of business organization. Also covers patent licensing; mining laws; regulations affecting employment; the various forms of taxation to which businesses are subject; and the availability of factory sites.

Manufacturing Industries, 1961-62, No. 23--Meat and Fish Preserving, by K. M. Archer, 10 pp., processed, October 3, 1963. Commonwealth Bureau of Census and Statistics, Canberra, Australia.

The Results of an Expedition to Bernier and Dorre Islands, Shark Bay, Western Australia, in July 1959, by W. D. L. Ride and others, Fauna Bulletin No. 2, 128 pp., illus., printed, 1962. Fisheries Department, 108 Adelaide Terrace, Perth, Western Australia.

Seventh Annual Report on the Operation of the Fishing Industry Act 1956 during the Year Ended 30th June, 1963, 8 pp., processed. Department of Primary Industry, Canberra, Australia. This report outlines the operations of the Fisheries Development Trust Account, established for the purpose of financing activities designed to foster the development of the Australian fishing industry, for the year ended June 30, 1963. It discusses the shrimp fishery in the Gulf of Carpentaria, research on sperm whales off Western Australia, training school for fisheries field officers, tuna long-lining, and Western Australian spiny lobster biological research.

BAIT:

"The Bloodworm Industry in the Maritimes," by M. C. Cormier, article, Trade News, vol. 16, no. 2, August 1963, pp. 3-5, illus., processed. Information and Consumer Service, Department of Fisheries, Ottawa, Canada.

BARNACLES:

"Effects of Copper Ion on Oxygen Uptake by Planktonic Cyprids of the Barnacle, *Balanus amphitrite* niveus," by Francis J. Bernard and Charles E. Lane, Contribution No. 465, 3 pp., illus., printed. (Reprinted from Proceedures of the Society for Experimental Biology and Medicine, vol. 113, 1963, pp. 418-420.) University of Miami, Marine Laboratory, Institute of Marine Science, 1 Rickenbacker Causeway, Miami 49, Fla.

BELGIUM:

Market for U. S. Products in Belgium (Supplement to International Commerce), by Robert H. Walker, 60 pp., illus., printed, 45 cents. Bureau of International Commerce, U. S. Department of Commerce, Washington, D. C., February 1963. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.) Provides general marketing information on Belgium, guidance on prospects for sales of selected commodities of special interest, and related material essential to

the U. S. businessman preparing to sell goods in Belgium. Includes a section on the market for frozen and convenience foods.

BIOCHEMISTRY:

"Autoxidation of Beef and Tuna Oxymyoglobins," by W. Duane Brown and Ami Dolev, article, Journal of Food Science, vol. 28, March-April 1963, pp. 207-210, printed. Institute of Food Technologists, 510-522 N. Hickory St., Champaign, Ill.

"Flavors from Fat," article, Food Processing and Packaging, vol. 31, no. 369, 1962, pp. 212-217, printed. Putman Publishing Co., 111 E. Delaware Pl., Chicago 11, Ill.

BOTULISM:

"FDA Investigating Botulism Outbreak from Smoked Whitefish," article, FDA Report on Enforcement and Compliance, October 1963, p. 18, processed. Food and Drug Administration, U. S. Department of Health, Education, and Welfare, Washington, D. C. 20201.

BRAZIL:

Pesca--1961, Estrutura e Producao (Fishing Industry, 1961, Structure and Production), 45 pp., processed in Portuguese. Ministerio da Agricultura, Servico de Estatistica da Producao, Rio de Janeiro, Brazil, April 1963.

BUFFALOFISH:

Consumer Acceptance of Fresh Buffalo Fish, by W. R. Morrison, Report Series No. 116, 24 pp., printed, 1963. Agricultural Experiment Station, University of Arkansas, Fayetteville, Ark.

CALIFORNIA:

A Historical Review of the Fish and Wildlife Resources of the San Francisco Bay Area, by John E. Skinner, Water Projects Branch Report No. 1, 236 pp., illus., printed, June 1962. Water Projects Branch, Department of Fish and Game, The Resources Agency of California, 722 Capitol Mall, Sacramento, Calif. 95814. Discusses the fishing ports; the early history of the commercial fisheries; the fisheries from 1870 to 1915, and from 1915 to the present; the fisheries of the Bay area today--schooling and pelagic fish, flatfish, bottomfish, sharks and skates, salt-water perch, croakers, molluscan and crustacean fisheries, freshwater fish, anadromous commercial fisheries; and economic aspects of the commercial fisheries. A section on anadromous fisheries covers king salmon, silver salmon and steelhead trout, striped bass, sturgeon, and American shad. The section on molluscan fisheries includes information on oysters, clams, abalone, and marine borers. The section on the crustacean fisheries discusses crabs, shrimp, and freshwater crayfish. The freshwater fisheries and marine mammals of the area are discussed. Included are many statistical tables giving historical data on various aspects of the fisheries.

CANADA:

Canadian Fisheries Reports, no. 2, October 1963, 31 pp., illus., printed. Information and Consumer Service, Department of Fisheries, Ottawa, Canada. Includes articles on: "Factors Affecting the Efficiency of Antibiotic Dips for Fresh Fish Fillets," by C. M. Blackwood, J. Liston, and J. A. Stern; "A Critical

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

Survey of Differential Media for the Demonstration of Coagulase-Positive Staphylococci in Food," by N. Neufeld and R. Garm; "Coliform Contamination in Lobster Meat Traced to Cooler Construction," by John M. Graham; and "Quality Changes in Vacuum Packed and Non-Vacuum Packed Frozen Lobster Meat during Storage at Different Temperatures," by W. A. Murphy and H. L. Newson.

Fishes of Ontario, by H. H. MacKay, 300 pp., printed, 1963. Department of Lands and Forests, Toronto, Ontario, Canada.

Fishing and Hunting in Canada, 1961, by D. A. Benson, 25 pp., printed, 1963. Canadian Wildlife Service, National Parks Branch, Department of Northern Affairs and National Resources, Ottawa, Canada. A report on an economic survey.

Rapport Annuel, 1962 (Annual Report, 1962), 209 pp., printed in French, 1963. Station de Biologie Marine, Grande-Riviere, Quebec, Canada.

"Trends in Canadian Atlantic Fisheries," by R. U. Mahaffy, article, Canadian Fisherman, vol. 50, no. 11, November 1963, p. 17, printed, single copy C\$2. National Business Publications Ltd., Gardenvale, Que., Canada.

"Trends in Canadian Atlantic Mainland Fisheries Past, Present, and Future," by W. R. Martin, article, Trade News, vol. 16, no. 2, August 1963, pp. 8-15, illus., processed. Information and Consumer Service, Department of Fisheries, Ottawa, Canada.

CANNING:

"Cools Cans Three Times Faster," article, Food Processing, vol. 23, no. 6, 1962, pp. 37-38, printed. Putman Publishing Co., 111 E. Delaware Pl., Chicago 11, Ill.

"Spin Processing of Canned Foods," article, Food Preservation Quarterly, vol. 22, no. 3, 1962, pp. 76-77, printed. Commonwealth Scientific and Industrial Research Organization, Division of Food Preservation, P. O. Box 43, Ryde, N. S. W., Australia.

"Vacuum Sealing Machine with Gas Supply, article, Technological Digests, vol. 7, no. 4, 1962, p. 67, printed. Organisation for Economic Co-Operation and Development, 2 Rue Andre Pascal, Paris, France.

CARP:

"Kanibalizm u Lychynok i Mal'kiv Sazana" (Cannibalism among the Larvae and Fry of the Carp), by O. I. Kudryns'ka, article, Dopovidi Akad. Nauk Ukrain. R. S. R., vol. 1, 1962, pp. 111-113, printed in Russian. Academy of Science of the Ukrainian SSSR, Kiev, Ukraine, U. S. S. R.

CASPIAN SEA:

"Pump Fishing in the Caspian Sea," article, Fishing News International, vol. 2, no. 3, July-September 1963, p. 304, illus., printed, single copy 6s. 6d. (about 85 U. S. cents). Arthur J. Heighway Publications Ltd., Ludgate House, 110 Fleet St., London EC4, England.

CETACEANS:

Riesenfische, Wale und Delphine (Giant Fishes, Whales and Dolphins), by J. R. Norman and F. C. Fraser, 342 pp., illus., printed in German, 1963. Verlag Paul Parey, Spitalerstrasse 12, Postfach 1129, 2000 Hamburg 1, Federal Republic of Germany. (Also available in an English edition from Putnam, 42 Great Russell St., London WC1, England.) Part I of this book is concerned with fishes, such as sharks, rays, perch-like fishes, barracuda, etc. Part II is concerned with cetaceans, such as whales, porpoises, and dolphins. The book includes a description of the better known forms but does not necessarily include every animal in these families. A biological description of these classes of animals is given for ready use to identify those that are covered. The book is designed to help the layman and scientist to make quicker and more ready identification.

--Walter H. Stolting

CEYLON:

Administration Report of the Director of Fisheries for 1961-62, Part IV--Education, Science and Art (L), 70 pp., printed in Sinhalese and English, 2740 (about 55 U. S. cents), August 1963. Government Publications Bureau, P. O. Box 500, Secretariat, Colombo, Ceylon. Reports on the activities of the Ceylon Department of Fisheries for 1961-62. Includes information on programs of the organization, disputes and regulations, loans to fishermen, cooperative societies, coastal navigation aids, and fishing harbors. Also covers fresh- and brackish-water fisheries, pearl fisheries, Mutwal fisheries factory and harbor, trawl-fishing, and fishery research. Included are statistical tables giving data on production of fresh-water and marine fish, mechanized fishing vessels, and imports and exports of fishery products.

CLAMS:

Seasonal Growth of the Northern Quahog, MERCENARIA MERCENARIA, and the Southern Quahog, M. CAMPECHIENSIS, in Alligator Harbor, Florida, by R. W. Menzel, Contribution No. 184, 10 pp., illus., processed. (Reprinted from Proceedings of the National Shellfish Association, vol. 52, 1961, pp. 37-46.) Oceanographic Institute, Florida State University, Tallahassee, Fla. Monthly shell length measurements were made of Mercenaria mercenaria for 3.5 years and of M. campechiensis for 2 years, in Alligator Harbor, Franklin County, Florida. The northern clams were laboratory-reared natives of Long Island Sound. They showed the best growth recorded for any locality, with greatest growth in spring and fall, less in winter, and least in summer. The southern clams, which originated in Alligator Harbor, grew faster than the northern species, with greatest growth in spring and fall, almost as much in summer, and least in winter.

COD:

"Kolichestvennaya Otsenka Skoplenii Baltiiskoi Treski s Pomoshch'yu Ekholota" (Quantitative Assessment of Cod Concentrations in the Baltic Using Sonar), by K. I. Yudanov, article, Rybnoe Khoziaistvo, no. 1, 1962, pp. 26-32, printed in Russian. VNIRO Glavni-proekta, pri Gosplanie SSSR, Moscow, U. S. S. R.

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

"Laanemere Tursk Randab." (Migrations of the Baltic Cod), by I. Stsukina, article, *Eesti Loodus*, vol. 6, 1961, pp. 361-363, printed in *Estonian Academy of Sciences of the Estonian SSSR, Tartu, U. S. S. R.*

"Svyaz' Gidrologicheskikh Uslovii s Kolebaniyami Chislennosti Pokolenii Treski" (Relationship between Hydrological Conditions and Fluctuations in the Numbers of Successive Year-Classes of Cod), by A. G. Kislyakov, article, *Trudy Soveshchaniy Ikhtiol. Komissiya Akad. Nauk SSSR*, vol. 13, 1961, pp. 260-284, printed in Russian. *Akademiya Nauk SSSR, Ikhtologicheskaya Komissiya, Moscow, U. S. S. R.*

"Where Do Seven Islands Cod Come From?" by Yves Jean, article, *Trade News*, vol. 16, no. 2, August 1963, pp. 6-7, illus., processed. Information and Consumer Service, Department of Fisheries, Ottawa, Canada.

CRABBING:

"Zinc Anodes Save Money for Commercial Crabbers," article, *Fish Boat*, vol. 8, March 1963, p. 13, printed. H. L. Peace Publications, 624 Gravier St., New Orleans 9, La.

CRABS:

"Influence of Hosts on the Behavior of the Commensal Crab, *PINNOTHERES MACULATUS* Say," by A. N. Sastry and R. Winston Menzel, Contribution No. 181, 8 pp., printed. (Reprinted from *Biological Bulletin*, vol. 123, no. 2, October 1962, pp. 388-395.) Oceanographic Institute, Florida State University, Tallahassee, Fla.

CUBA:

"Afloramiento y Corrientes Cercanas a Cuba (Upwelling and Currents Near Cuba), by Juan J. Tapanes, Contribution No. 17, 28 pp., illus., printed in Spanish, July 1963. Centro de Investigaciones Pesqueras, Departamento de Pesca, Playa Habana, Bauta, Cuba.

DAHOMEY:

"Investment Law in the Republic of Dahomey, OBR 63-104, 12 pp., printed, 15 cents. Bureau of International Commerce, U. S. Department of Commerce, Washington, D. C., August 1963. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.) The Investment Code of the Republic of Dahomey was enacted by the National Assembly on December 31, 1961, as part of the Dahomean Government's program to encourage foreign private investment. The Code guarantees basic rights to all private investors and provides preferential benefits for undertakings contributing to the country's national development. The report presents a summary of provisions of the code and the complete text of the code covering establishment of an investment code, system of ordinary law, systems of preferential treatment, instructions for submitting applications for approval under the investment code, regulations governing foreign investment in the Franc Area; and information to be furnished in support of an application for approval of investment in Dahomey.

DEHYDRATION:

"The Influence of Dehydration of Foods on the Digestibility and the Biological Value of the Protein,"

by A. P. De Groot, article, *Food Technology*, vol. 17, March 1963, pp. 103-107, printed. The Garrard Press, 510 N. Hickory, Champaign, Ill.

"Instant Fish-Potato Flakes," by J. J. Quigley and L. E. Deveau, article, *Trade News*, vol. 16, no. 3, September 1963, pp. 8-9, illus., processed. Information and Consumer Service, Department of Fisheries, Ottawa, Canada. A process for producing instant fish-potato flakes, which should prove a real boon for the busy homemaker and restaurant owner is now being tested and improved by the Canadian Department of Fisheries at its Fish Processing Experimental Plant located at Valleyfield on Newfoundland's north-east coast. The process involves the dehydration of a mixture of cooked fish and cooked potatoes on an external type drum dryer. The final product consists of snowy white, fine, dry flakes, each flake containing fish and potato. The flakes may be used for preparing fishcakes, croquettes, fish soup, chowder, or casseroles.

DIRECTORIES:

"Directory of the Public Aquaria of the World, by Spencer Tinker and Marian Omura, 37 pp., printed, 1963. Waikiki Aquarium, Honolulu, Hawaii.

DRUM:

"A Study of Redfish, *Sciaenops ocellata* (Linnaeus) and Black Drum, *Pogonias cromis* (Linnaeus)," by Ernest G. Simmons and Joseph P. Breuer, article, *Publications of the Institute of Marine Science*, vol. 8, 1962, pp. 184-211, printed. Institute of Marine Science, University of Miami, 1 Rickenbacker Causeway, Miami 49, Fla.

DRYING:

"Investigations on Dehydration of Some Commercial Fish in India," by P. V. Prabhu and others, article, *Current Affairs Bulletin*, no. 37, August 1963, pp. 1-12, illus., printed. Indo-Pacific Fisheries Council, Food and Agriculture Organization of the United Nations, Bangkok, Thailand.

EL SALVADOR:

"Foreign Trade Regulations of El Salvador, OBR 63-109, 8 pp., processed, 15 cents. Bureau of International Commerce, U. S. Department of Commerce, Washington, D. C., July 1963. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.) Covers trade policy, import tariff system, sales and other internal taxes, and documentation and fees. Also discusses labeling and marking requirements, special customs provisions, nontariff import trade controls, United States controls, and Government representation in the United States. Pending ratification of the San Jose Protocol (Signed July 1962) to the Central American Convention on the Equalization of Import charges, preferential import duty rates are applicable to unpacked cod, edible fish eggs and sardines.

EUROPEAN COMMON MARKET:

"Une Nouvelle Reunion de Hauts Fonctionnaires des Peches du Marche Commun s'Est Tenu a Bruxelles le 6 Septembre" (A New Meeting of High Officials in the Fisheries of the Common Market is Held in Brussels on September 6), article, *La Pêche Maritime*, vol. 42, no. 1026, September 1963, p. 571, printed in

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

French, single copy 12 F (about US\$2.45). Les Editions Maritimes, 190, Boulevard Haussmann, Paris, France.

FACTORYSHIPS:

"BMV Delivery of Shrimp Factory Ship to Pakistan," article, *Norwegian Fishing and Maritime News*, vol. 9, no. 4, 1962, p. 11, printed. *Norwegian Fishing and Maritime News*, P. O. Box 740, Slottsgt. 3, Bergen, Norway.

"The Development of Factory Ships and of Related Media in Ocean Fisheries, III," by Onar Onarheim, article, *Norwegian Fishing and Maritime News*, vol. 10, no. 3, 1963, pp. 31, 33, 35, printed. *Norwegian Fishing and Maritime News*, P. O. Box 740, Slottsgt. 3, Bergen, Norway.

FARM PONDS:

"Standing Crops of Fish in Oregon Farm Ponds," by Gary W. Isaac and Carl E. Bond, article, *Transactions of the American Fisheries Society*, vol. 92, no. 1, 1963, pp. 25-29, printed. Secretary, American Fisheries Society, P. O. Box 483, McLean, Va.

FIRST AID:

The Ship's Medicine Chest and First Aid at Sea, 498 pp., illus., printed, revised 1955. Public Health Service, U. S. Department of Health, Education, and Welfare, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.) Includes chapters on the structure and functions of the human body, hygiene, general nursing care, first aid, and the classification and treatment of diseases. Provides instructions beyond first aid, as continued treatment and after care may be necessary until the services of a physician become available.

FISH BEHAVIOR:

"The Fright Reaction in North American Fish," by Wolfgang Pfeiffer, article, *Canadian Journal of Zoology*, vol. 41, no. 1, 1962, pp. 69-77, printed. Division of Administration, National Research Council, Sussex St., Ottawa 52, Canada.

"Maksimal'nye Skorosti Dvizheniya Ryb." (The Maximum Speeds of Movement of Fishes), by V. N. Chestnoi, article, *Rybnoe Khoziaistvo*, vol. 9, 1961, pp. 22-27, printed in Russian. VNIRO Glavniproekta, pri Gosplanie SSSR, Moscow, U. S. S. R.

FISH CULTURE:

The Susquehanna Fishery Study, 1957-1960; a Report of a Study on the Desirability and Feasibility of Passing Fish at Conowingo Dam, Contribution No. 169, 81 pp., printed, 1961. Department of Research and Education, Solomons, Md.

FISH HANDLING:

Handling Sea-Frozen Fish, by A. Banks, Torry Advisory Note No. 2, 8 pp., printed. Torry Research Station, Aberdeen, Scotland.

Take Care of Your Catch, Torry Advisory Note No. 4, 3 pp., printed, 1962. Torry Research Station, Aberdeen, Scotland.

FISHING VESSEL STABILITY:

The following papers were presented before the Food and Agriculture Organization Fishing Vessel Stability Meeting, Gdansk, Poland, October 7-14, 1963. A limited number of copies are available free from the Fisheries Division, Food and Agriculture Organization of the United Nations, Viale delle Terme di Caracalla, Rome, Italy.

Systematic Stability Investigations of Danish Fishing Vessels, by Poul Fribert and Leo Retvig, Paper No. 3, 18 pp., illus., processed.

The Sizing and Rating of the Stability Criteria of Fishing Vessels in the GDR, by G. Mitschka, Paper No. 6, 11 pp., processed.

Stability of Icelandic Fishing Vessels, by Hjalmar R. Bardarson, Paper No. 7, 18 pp., illus., processed.

Casualty and Stability of Japanese Fishing Vessels, by Atsushi Takagi, Paper No. 8, 11 pp., illus., processed.

Stability Security Measure, by Seitaro Kojima, Paper No. 9, 7 pp., processed.

Center of Gravity and Freeboard of a Ship Observed from a Viewpoint of the Stability Criterion, by Toshio Hishida and Norio Tanaka, Paper No. 10, 19 pp., illus., processed.

Stability Standard for Two-Boat Trawlers and Purse Seiners, by Tsutomu Tsuchiya, Paper No. 11, 9 pp., illus., processed.

A Remarkable Case of Capsizing of a Small Trawler, by J. G. De Wit, Paper No. 12, 4 pp., illus., processed.

Stability of Double-Rig Beam Trawlers, by J. G. De Wit, Paper No. 13, 8 pp., illus., processed.

Polish Experience Concerning the Normalization of Fishing Vessels' Stability, by Olgierd Jablonski, Paper No. 14, 8 pp., processed.

Problems Connected with the Introduction of International Rules for Fishing Vessels' Stability, by Lech Kobylinski, Paper No. 15, 7 pp., processed.

Some Suggestions on Investigations into Fishing Vessels' Stability, by Kazimierz Szponar, Paper No. 16, 2 pp., processed.

Analysis of the Relative Value of the Criteria Regarding the Stability of Fishing Vessels, by Jan Dudziak, Paper No. 17, 16 pp., illus., processed.

Stability Properties of Polish Trawlers, by Kazimierz Sokolowski, Paper No. 18, 31 pp., illus., processed.

Operational Stability Control on Fishing Vessels, by Olgierd Jablonski, Paper No. 19, 13 pp., illus., processed.

Transverse Stability for Small Ships or Crafts, by Patricio R. Roda, Paper No. 20, 35 pp., processed.

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

Freeboard, Stability, Bulwark Freeing Port, Hatch and Access Standards of Small Craft, by H. S. Townsend, Paper No. 21, 10 pp., processed.

Stability of Trawlers, by R. Norrby, Paper No. 22, 5 pp., processed.

Some Thoughts on Stability Criteria, by George C. Nickum, Paper No. 23, 8 pp., illus., processed.

Analysis of Cross Curves of Fishing Trawlers, by Krystyn Kupras and Włodzimierz Majewski, Paper No. 25, 8 pp., illus., processed.

FISHING WITH LIGHTS:

"Fishing with Electric Lights for Black Sea Horse Mackerel," by A. Dolgov, article, Rybnoe Khozjal'stvo, vol. 37, no. 2, 1961, pp. 53-55, printed in Russian. VNIRO Glavniproekta, pri Gosplanie SSSR, Moscow, U. S. S. R.

FISH-LIVER OILS:

"The Air Blowing of Cod Liver Oil. II--Changes in Fatty Acid Composition as Determined by Gas-Liquid Chromatography," by P. M. Jangaard and others, article, Journal of the Fisheries Research Board of Canada, vol. 20, January 1963, pp. 89-94, printed. Queen's Printer and Controller of Stationery, Ottawa, Canada.

"Growth of Rats Given Cod Liver Oil," by R. J. Ward and C. C. Amos, article, British Journal of Nutrition, vol. 16, 1962, pp. 219-222, printed. Cambridge University Press, 200 Euston Rd., London NW1, England.

"Preliminary Studies on the Methods of Extraction and Determination of Vitamin A Content of Liver Oils of Common Philippine Market Fishes," by S. V. Bersamin, L. G. Salcedo, and G. Guevara, article, Current Affairs Bulletin, no. 37, August 1963, pp. 13-18, illus., printed. Indo-Pacific Fisheries Council, Food and Agriculture Organization of the United Nations, Bangkok, Thailand.

FISH MEAL:

"Differences in Quality of Fish Meals," by L. E. Ousterhout, article, Canadian Fisherman, vol. 50, no. 10, October 1963, pp. 18-20, printed, single copy \$2. National Business Publications Ltd., Garden-ville, Que., Canada. Two fish meals which may have the same protein, fat, and ash content, may differ widely in feeding value. These differences are discussed in this article. Although written with anchovy meal primarily in mind, the article gives good advice on the quality production of any type of fish meal. The quality is affected by the method of cooking, drying, curing, and storing. The way any one fish meal drier is operated can have a much greater effect on the nutritive value of the meal than can the differences between types of driers.

"Iceland Invention Boosts Meal Production," article, World Fishing, vol. 11, no. 10, 1962, pp. 8-9, illus., printed. John Trundell & Partners Ltd., St. Richards House, Eversholt St., London NW1, England.

"New Swedish Shipboard Fish Meal Plant," article, World Fishing, vol. 11, no. 10, 1962, p. 77, illus.,

printed. John Trundell & Partners Ltd., St. Richards House, Eversholt St., London NW1, England.

El Tamizado y la Molienda en la Harina de Pescado (The Screening and Milling of Fish Meal), by E. Arnesen, J. Sanchez, and R. Lam, Report No. 10, 15 pp., illus., processed in Spanish, 1963. Library, Instituto de Investigacion de los Recursos Marinos, P. O. Box 3734, Lima, Peru.

FISH OIL:

"Nutritive Value of Marine Oils. I--Menhaden Oil at Varying Oxidation Levels, with and without Antioxidants in Rat Diets," by A. A. Rasheed and others, article, Journal of Nutrition, vol. 79, March 1963, pp. 323-332, printed. American Institute of Nutrition, 36th St. at Spruce, Philadelphia 4, Pa.

FISH PONDS:

"Povyshenie Ryboproduktivnosti Vyrostnykh Prudov Putem Primeneniya Udobrenii" (Increasing the Fish Productivity of Rearing Ponds by the Use of Fertilizers), by L. I. Mamontova, article, Doklady Moskov. Sel'skokhoz. Akad. Im. K. A. Timiryazeva, vol. 69, 1961, pp. 171-174, printed in Russian. Podsosenski Per. 21, Moscow B-64, U. S. S. R.

FISH POPULATIONS:

"The Application of Some Special Immunological Methods to Marine Population Problems," by George J. Ridgway, article, American Naturalist, vol. 96, no. 889, 1962, pp. 219-224, printed. The Science Press, Lancaster, Pa.

FISH PROTEIN CONCENTRATE:

"Chemical Composition and Shelflife of a Protein Food Based on Low-Fat Groundnut Flour, Bengalgram Flour, and Fish Flour;" "Supplementary Value of Proteins of Fish Flour to Those of Groundnut Flour and the Protein Efficiency Ratio of Protein Food Containing Groundnut, Bengalgram, and Fish Flour;" "Supplementary Value of Fish Flour and a Protein Food Containing Low-Fat Groundnut Flour, Bengalgram Flour, and Fish Flour to Poor Rice Diet," by S. R. Shurpalekar and others, articles, Food Science, vol. 11, no. 2, 1962, pp. 39-48, printed. Central Food Technological Research Institute, Mysore, India.

FLORIDA:

"Biological Investigations of the St. Lucie Estuary (Florida) in Connection with Lake Okeechobee Discharges through the St. Lucie Canal," by Gordon Gunter and Gordon E. Hall, article, Gulf Research Reports, vol. 1, no. 5, August 1963, pp. 189-317, illus., printed. Gulf Coast Research Laboratory, Ocean Springs, Miss.

Summary of Florida Commercial Marine Landings, 1962, and an Analysis of the Catch and Effort of Certain Species, by Albert Rosen and Richard K. Robinson, Marine Fisheries Research 63-4, 30 pp., illus., printed, June 1963. Florida State Board of Conservation, W. V. Knott Bldg., Tallahassee, Fla.

FOOD AND AGRICULTURE ORGANIZATION:

Information Bulletin, General Fisheries Council for the Mediterranean, no. 23, November 1962, 43 pp., illus., processed. General Fisheries Council for the Mediterranean, Food and Agriculture Organization

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

of the United Nations, Viale delle Terme di Caracalla, Rome, Italy. Discusses the Freedom from Hunger Campaign, activities of the GFCM, activities of FAO, and news of member countries. Also includes information on international organizations and meetings, fisheries statistics for 1961, and schedule of international meetings of interest to fisheries workers.

FOOD TECHNOLOGY:

"Food Technologists Study Fish," by Kay Stewart, article, *Trade News*, vol. 16, no. 3, September 1963, pp. 6-7, processed. Information and Consumer Service, Department of Fisheries, Ottawa, Canada.

FRANCE:

"L'Administration a Prime des Projets de Chalutiers-Senneurs pour la Peche Artisanale" (The Administration's First Project is Trawlers-Purse Seiners for the Artisan Fishery), article, *La Peche Maritime*, vol. 42, no. 1026, September 1963, pp. 577-580, illus., printed in French, single copy 12 F (about US\$2.45). Les Editions Maritimes, 190, Boulevard Haussmann, Paris, France.

"Le Plan de Relance 1963 Marque un Tournant de Ses Principes et de Ses Procedures d'Etablissement" (The Renewal Plan of 1963 Marks a Turning Away from its Principles and Established Procedures), article, *La Peche Maritime*, vol. 42, no. 1026, September 1963, p. 575, printed in French, single copy 12 F (about US\$2.45). Les Editions Maritimes, 190, Boulevard Haussmann, Paris, France.

FREEZER VESSELS:

"Development of Tuna Freezing Equipment for B. C. Seine Boats," by S. W. Roach and J. S. M. Harrison, article, *Western Fisheries*, vol. 66, April 1963, pp. 28-30, 32, printed. Roy Wrigley Publications Ltd., 1104 Hornby St., Vancouver 1, B. C., Canada.

FRESH-WATER FISH:

"The Efficiency of Reproduction and Recruitment in Freshwater Fish," by E. D. Le Cren, article, *British Ecological Society Symposium*, vol. 2, 1962, pp. 283-296, printed. Honorary Secretary, British Ecological Society, Osmington House, Osmington, Weymouth, Dorset, England, 1962.

"The Status of Spearfishing and the Use of SCUBA in Fish Management Programs in the Freshwaters of the United States," by Richard L. Poole, article, *Transactions of the American Fisheries Society*, vol. 92, no. 1, pp. 30-33, printed. Secretary, American Fisheries Society, P. O. Box 483, McLean, Va.

"A Study of the Numbers and Kinds of Species Found in Rivers in Eastern United States," by Ruth Patrick, article, *Proceedings of the Academy of Natural Sciences of Philadelphia*, vol. 113, no. 10, 1962, pp. 215-258, printed. Academy of Natural Sciences of Philadelphia, 19th St. and the Parkway, Philadelphia 3, Pa.

GEAR:

"Atlas Freshwater Generator," article, *Norwegian Fishing and Maritime News*, vol. 9, no. 1, 1962, pp. 41, 45, illus., printed. Torolf Holme, P. O. Box 740, Slottsgt. 3, Bergen, Norway.

"Degradation of Manila Cordage by Marine Fungi: Analysis of Breaking Strength Tests," by Samuel P. Meyers and others, Contribution No. 429, 4 pp., illus., printed. (Reprinted from TAPPI, vol. 46, no. 2, February 1963, pp. 164A-167A.) University of Miami, Marine Laboratory, 1 Rickenbacker Causeway, Miami 49, Fla.

"High Speed Diesel Engine for Fishing Vessels of Not Less than 100 Feet," by J. R. Read, article, *Canadian Fisherman*, vol. 49, no. 8, 1962, pp. 22-27, illus., printed. National Business Publications Ltd., Gardenvale, Que., Canada.

GEAR RESEARCH:

"Progress Seen in Shrimp Gear Research," by Frederick Watne, article, *Fish Boat*, vol. 8, March 1963, pp. 24, 37, printed. H. L. Peace Publications, 624 Gravier St., New Orleans 9, La.

GENERAL:

"Food Production for the Expanding World Population," by E. J. Russel, article, *Advancement of Science*, vol. 18, 1962, pp. 427-435, printed. The British Association for the Advancement of Science, Burlington House, London W1, England.

A History of Fishes, by J. R. Norman, 429 pp., illus., printed, 81s. (about US\$11.35). Ernest Benn, Ltd., Bouverie House, 154 Fleet St., London EC4, England, 1963.

GHANA:

Fisheries Research Report, vol. 1, no. 1, 1962, 33 pp., illus., processed. Fisheries Inspectorate Unit, Ministry of Agriculture, Accra, Ghana. Presents articles on: "Marine Fisheries Research in Ghana--Its Scope and Development," by M. Zei; "The Appearance of Plankton from August 16 to December 21, 1962," by M. A. Mensah; "Improving the Traditional Method of Smoking," by J. N. N. Adjetei; and "The Herring Season," by D. A. Hammond.

GREAT LAKES:

"Limnological and Meteorological Observation Towers in the Great Lakes," by Roger E. Deane, article, *Limnology and Oceanography*, vol. 8, no. 1, 1963, pp. 9-15, printed. Limnology and Oceanography, Woods Hole Oceanographic Institution, Woods Hole, Mass.

GREENLAND:

Okonomisk Politik i Gronland (Economic Policy in Greenland), by Mogens Boserup and Viggo Svendsen, 520 pp., illus., printed in Danish with English summary, Kr. 20 (US\$2.90). Ministeriet for Gronland, Hausergade 3, Copenhagen K, Denmark, 1963. A study divided into 3 principal sectors devoted to discussions of: (1) the long-range prospects for economic expansion in Greenland; (2) the economic structure, i.e., the interplay of Government, cooperative, and private economic activity; and (3) wage and price policies. Although dealing primarily with problems of internal Danish significance, the book contains much information of general interest and a large amount of statistical data. A chapter devoted to the Greenland fisheries discusses the catch, prices, and changes in price structure. A chapter on the prospects for Greenland's fishing industry discusses

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

geographical, human, and technical prerequisites, and various measures which might help to accelerate the transition to more modern methods of fishing. Other chapters contain considerable material on Greenland's fisheries.

HERBICIDES:

Method of Controlling Aquatic Plants, by J. V. Overbeek, U. S. Patent 2,959,476, printed. Patent Office, U. S. Department of Commerce, Washington, D. C. 20231.

HERRING:

"The Manufacture of Quick Frozen Marinated Herring," by H. Houwing, article, *Conserva*, vol. 10, no. 9, 1962, pp. 183-186, printed in Dutch. Maanblad voor de Voedings- en Genotmiddelen-Industrie, Moormans Periodieke, Pers N. V., The Hague, Netherlands.

ICHTHYOLOGY:

"Collecting and Preserving Fishes," by Frank B. Cross, article, *University of Kansas Museum of Natural History Miscellaneous Publication, No. 30*, pp. 41-44, printed. Museum of Natural History, University of Kansas, Lawrence, Kan.

INDIA:

Foreign Trade Regulations of India, OBR 63-120, 8 pp., printed, 15 cents, September 1963. Bureau of International Commerce, U. S. Department of Commerce, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.) The import policy of India is based on the availability of foreign exchange, the economic needs of the country, and the requirements of industry and other consumers. The report discusses India's import tariff system, sales and other internal taxes, documentation and fees, labeling and marking requirements, and special customs provisions. Also covers nontariff import trade controls, India's export controls, United States controls on exports and imports, and diplomatic representation between India and the United States.

INLAND FISHERIES:

"Biologicheskii Osnovy Rybnogo Khozyaistva na Vnutrennykh Vodoemakh" (Biological Principles of Fisheries of Inland Waters), by B. G. Ioganzhen, article, *Biol. Osnovy Rybn. Khoz. Tomskii Univ.*, Tomsk, 1959, pp. 9-30, printed in Russian. Tomskii University, Tomsk, U. S. S. R.

INTERNATIONAL COMMISSIONS:

International North Pacific Fisheries Commission, Bulletin No. 11, 159 pp., illus., printed, 1963. International North Pacific Fisheries Commission, 6640 Northwest Marine Dr., Vancouver 8, B. C., Canada. Contains articles on: "Ocean Conditions in the Vicinity of the Aleutian Islands, Summer 1957," by Richard J. Callaway; "Racial Analysis of Red Salmon by Means of Scales," by Kenneth H. Mosher; "Oceanographic Conditions and Salmon Distribution South of the Alaska Peninsula and Aleutian Islands, 1956," by Felix Favorite and Mitchell G. Hanavan; "Use of a Discriminant Function in the Morphological Separation of Asian and North American Races of Pink Salmon, *Oncorhynchus gorbuscha* (Walbaum)," by Murray H. Amos, Raymond E. Anas, and Roger E. Pearson; and "Parasites as Indicators of the Geographical Origin of Sockeye Salmon, *Oncorhynchus nerka* (Walbaum), Occurring in the North Pacific Ocean and Adjacent Seas," by Leo Margolis.

International North Pacific Fisheries Commission Statistical Yearbook, 1962, 68 pp., printed, 1963. International North Pacific Fisheries Commission, 6640 Northwest Marine Dr., Vancouver 8, B. C., Canada.

INVERTEBRATES:

Fresh-Water Invertebrates of the United States, by Robert W. Pennak, 778 pp., printed, 1963. Ronald Press, 15 E. 26th St., New York 10, N. Y.

IRRADIATION PRESERVATION:

"Push for Progress in Food Irradiation," by Ferdinand P. Mehrlich, article, *Food Processing*, vol. 24, May 1963, pp. 84-89, printed. Putman Publishing Co., 111 E. Delaware Pl., Chicago 11, Ill.

JAPAN:

Bulletin of the Japanese Society of Scientific Fisheries, vol. 29, no. 5, May 1963, 112 pp., illus., printed in Japanese with English abstracts. Bureau of the Society, c/o Tokyo University of Fisheries, Shiba Kaidori 6, Minato-ku, Tokyo, Japan. Includes, among others, articles on: "Tissue Distribution of Mercury Orally Given to Fish," by Hanato Tsuruga; "Studies on Fishing Conditions of the Dolphin, *Coryphaena hippurus* L., in the Western Region of the Sea of Japan. VII--Relationship between the Stomach Contents and the Pelagic Fauna of Juveniles," by Shunpei Kojima; "Studies on the Movement of Shoals of Mackerel and Its Environmental Factors. II--The Relationship between the Floating-Up of Mackerel Shoals in the Bay of Ishikari, Hokkaido, and the Environmental Factors," by Takeo Kawakami; "Some Factors Having Effects on the Behavior of Salmon in the Time of Gill-Netting," by Kisaburo Taguchi; "On the Fatigue of Netting Twines against Repeated Impact Loads," by Katsuji Honda; "A Model Experiment of Aquatic Food Chain with Special Significance in Fatty Acid Conversion," by Mitsuo Kayama, Yasuhiko Tsuchiya, and James F. Mead; "Variations in Chemical Composition in Some Commercial Fishes from the South of Brazil," by Ko Watanabe; "Yield and Proximate Composition of Sea-Trout from Southern Brazil," by Ko Watanabe; and "On the Tagging Experiments for Fisheries Research in Japan," by Kenji Kurogane.

Bulletin of the Japanese Society of Scientific Fisheries, vol. 29, no. 4, April 1963, 113 pp., illus., printed in Japanese with English abstracts. Bureau of the Society, c/o Tokyo University of Fisheries, Shiba Kaidori 6, Minato-ku, Tokyo, Japan. Includes, among others, these articles: "Studies on Reproduction of Rainbow Trout, *Salmo gairdneri*, with Special Reference to Egg Taking. IV--The Fecundity or Number and Weight of Eggs Taken," by Minoru Nomura; "A Study of Herring on the Coast of Olyutorskii Region," by Yohiko Yunokawa; "Quality of Kombu, Edible Seaweeds Belonging to the Laminariaceae. VI--Effect of the First Processing," by Keiichi Oishi and others; "Studies on Muscle of Aquatic Animals. XXXVII--Octopine in Squid Muscle," by Kinji Endo and Wataru

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

Simidu; "Studies on Muscle of Aquatic Animals. XXXVIII--Changes in Nitrogenous Extractives of Squid Muscle during Storage," by Kinji Endo, Masao Hujita, and Wataru Simidu; "Carotenoid Pigments in Fish. I--Carotenoids in Goldfish and Fancy Colored Carp," by Shuichi Hirao, Ryo Kikuchi, and Hisako Taguchi; and "Carotenoid Pigments in Fish. II--Effect of Dietary Carotenoid on Body Color of Goldfish," by Shuichi Hirao, Satoko Ozawa, and Yasuko Suematsu.

The Island of the Fisherwomen, by Fosco Maraini, 95 pp., illus., printed, \$6.75. Harcourt, Brace and Co., Inc., 383 Madison Ave., New York 17, N. Y., April 1963.

"Japan's Fisheries Education," by S. Konda, article, Fishing News International, vol. 1, no. 4, 1962, pp. 59-61, printed. Arthur J. Heighway Publications, Ltd., Ludgate House, 110 Fleet St., London EC4, England.

Progress Report of the Cooperative Investigations on Important Neritic-Pelagic Fisheries Resources, 1959, 128 pp., illus., printed in Japanese and English, November 1962. Tokai Regional Fisheries Research Laboratory, Tsukushima, Chuo-ku, Tokyo, Japan.

Progress Report of the Cooperative Investigations on Important Neritic-Pelagic Fisheries Resources, 1958, 149 pp., illus., printed in Japanese and English, March 1962. Tokai Regional Fisheries Research Laboratory, Tsukushima, Chuo-ku, Tokyo, Japan.

LARVICIDE:

"Histological Effects of 3-Trifluoromethyl-4-Nitrophenol (TFM) on Larval Lamprey and Trout," by Ronald M. Christie, article, Canadian Journal of Zoology, vol. 41, no. 1, 1962, pp. 51-62, printed. Division of Administration, National Research Council, Sussex St., Ottawa 52, Canada.

LOBSTERS:

Current-Voltage Relations in the Lobster Giant Axon Membrane under Voltage Clamp Conditions, by Fred J. Julian, John W. Moore, and David E. Goldman, 20 pp., printed, January 30, 1962. (Reprinted from Journal of General Physiology, vol. 45, no. 6, July 1962, pp. 1217-1238.) Naval Medical Research Institute, Bethesda, Md., 20014.

"Lobsters Are Local," by D. G. Wilder, article, Trade News, vol. 16, no. 3, September 1963, pp. 3-5, illus., processed. Information and Consumer Service, Department of Fisheries, Ottawa, Canada.

Processing Lobsters, by J. J. Waterman, Torry Advisory Note No. 6, 3 pp., printed, 1963. Torry Research Station, Aberdeen, Scotland.

MACKEREL:

Analyse du Contenu du Tractus Digestif du Stade Planctonique de Maquereau (SCOMBER SCOMBRUS L.) en Adriatique (Analysis of the Contents of the Digestive Tract of Postlarval Mackerel (Scomber scombrus L.) in the Adriatic), by J. Karlovac, Reports, vol. IV, no. 4a, 18 pp., illus., printed in Serbo-Croatian with French summary, 1962. Institut za Oceanografiju i Ribarstvo, Split, Yugoslavia.

A Method of Collection, Transportation and Post-Incubation of PLEUROGRAMMUS AZONUS Roe and the Greenlings and Their Introduction into the Northern Seas of the U. S. S. R., by Yu. I. Orlov, L. V. Polikashin, and T. S. Rass, OTS 63-21510, 32 pp., printed, April 4, 1963. (Translated from the Russian, Trudy Akademii Nauk SSSR. Institut Okeanologii, vol. 59, 1962, pp. 183-203.) Office of Technical Service, U. S. Department of Commerce, Independence Ave. and Ohio Dr. SW., Washington, D. C. 20235.

MARINE CORROSION:

The Marine Corrosion Handbook, by T. Howard Rogers, 297 pp., illus., printed, 1960. McGraw-Hill Book Co., Inc., 330 W. 42nd St., New York 18, N. Y.

MARINE MICROBIOLOGY:

Preliminary Survey of the Microflora and Microfauna Occurring on Experimental Anti-Fouling Panels in the Kishon Harbour, by B. Komarovskiy and T. Edelstein, Technical Paper No. 42, 3 pp., printed. (Reprinted from General Fisheries Council for the Mediterranean, Proceedings and Technical Papers, No. 6, 1961, pp. 285-287.) General Fisheries Council for the Mediterranean, Food and Agriculture Organization of the United Nations, Viale delle Terme di Caracalla, Rome, Italy.

MARYLAND:

Maryland Marine Facilities, edited by William B. Mathews, Jr., 34 pp., printed, 35 cents. Department of Tidewater Fisheries, Annapolis, Md., May 1962.

MASSACHUSETTS:

Fisheries Report for Some Central, Eastern, and Western Massachusetts Lakes, Ponds, and Reservoirs, 1951-52, by Richard H. Stroud, 454 pp., illus., printed, 1955. Division of Fisheries and Game, Bureau of Wildlife Research and Management, 73 Tremont St., Boston, Mass. The sixth in a series of fisheries reports covering the biological survey of Massachusetts ponds in eleven of the counties. In addition to recommendations for the management of each of the ponds studied, it contains a discussion of fish management problems, a study of hybridization between two species of pickerel, and a manual for a reconnaissance survey of lakes and ponds.

MINK RATIONS:

"A Secondary Induced Thiamine Deficiency in Mink," by F. M. Stout, J. E. Oldfield, and J. Adair, article, National Fur News, vol. 35, no. 8, September 1963, pp. 22, 30, illus., printed. Broyles, Allebaugh and Davis, Inc., 200 Clayton St., Denver 6, Colo., 80206.

NETHERLANDS:

Statistiek van de Visserij, 1962 (Fisheries Statistics, 1962), J 31/1962, 41 pp., processed in Dutch with English table of contents and captions, f. 4.25 (about US\$1.20), 1963. Uitgeversmaatschappij W. de Haan N. V., Zinzendorfflaan 3, Zeist, Netherlands.

NEW HAMPSHIRE:

Fisheries Division, 1962 Annual Report of Operations, by Bernard W. Corson, 23 pp., processed. Fisheries Division, New Hampshire Fish and Game Department, Concord, N. H.

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

NEW ZEALAND:

"Harvest of the Sea, 1985: A Well Exploited Fishing Industry," by J. E. Morton, article, *Commercial Fishing*, vol. 2, no. 1, September 1963, pp. 28-30, illus., printed. Trade Publications Ltd., 47 Lewis Eady Bldg., 192 Queen St., Auckland, New Zealand.

NORTHERN RHODESIA:

Game and Fisheries Annual Report for the Year 1962, 36 pp., illus., printed, 2s. 6d. (about 35 U. S. cents), 1963. The Government Printer, Lusaka, Northern Rhodesia. The section on fisheries discusses research; work on fisheries development; progress in fresh-water fisheries in Luapula Province, Northern Province, and Southern Area; and accomplishments in fish farming, fishery investigations, and extension work. Also includes a report by the Chief Fisheries Research Officer covering activities of the Department of Fisheries and Game, and the research program.

OCEANOGRAPHY:

British Columbia Inlet Cruises, 1962, Data Report No. 21, 90 pp., printed, 1963. British Columbia Institute of Oceanography, Vancouver, B. C., Canada.

First National Coastal and Shallow Water Research Conference, October 1961, Proceedings, edited by D. S. Gorsline, 897 pp., printed, 1962. Florida State University, Tallahassee, Fla.

"Man Explores the Sea," by T. F. Gaskell, article, *Fishing News International*, vol. 2, no. 3, July-September 1963, pp. 285-286, printed, single copy 6s. 6d. (about 85 U. S. cents). Arthur J. Heighway Publications Ltd., Ludgate House, 110 Fleet St., London EC4, England. In the long run, the study of fish in the sea may be the most necessary of all our oceanographic researches because we shall increasingly be made to turn to the sea as a vast food producer by the increase in the world population, states the author.

"Rybolovstvo i Nekotorye Voprosy Okeanologii" (Fishing and Some Problems of Oceanography), by Yu. Marti, article, *Okeanologiya*, vol. 1, no. 5, 1961, pp. 779-790, printed in Russian. Akademia Nauk SSSR, Moscow, U. S. S. R.

The Sea (Ideas and Observations on Progress in the Study of the Seas), vol. 3, *The Earth Beneath the Sea: History*, edited by M. N. Hill, 979 pp., illus., printed, \$28, 1963. Interscience Publishers, John Wiley and Sons, Inc., 440 Fourth Ave., New York 16, N. Y. This is the third and last volume of *The Sea*, a project started to provide up-to-date accounts of many of the ideas, observations, and trends of research in oceanography and related earth sciences. This volume is largely on the geology of the sea floor: topography, structure, sediments, the techniques and history of exploration, and the processes at work in and on the sea floor. Extensive information on the historical geology of the ocean basins is also included. Noteworthy is a chapter on the origin of life.

The Sea; the Largest Continent in the World, by Hein Wenzel and others, 188 pp., illus., printed, \$17.50. Rand McNally Co., 536 S. Clark St., Chicago 5, Ill., 1962.

Travaux du Centre de Recherches et d'Etudes Oceanographiques, New Series, vol. V, no. 1, May 1963, 34 pp., illus., printed in French. Centre de Recherches et d'Etudes Oceanographique, 1, Quai Branly, Paris (7^e), France. Includes articles on: "Sur les Variations Saisonnières de la Circulation Superficielle dans le Secteur Nord-Est de la Méditerranée Occidentale" (On the Seasonal Variations in the Surface Circulation in the Northeast Sector of the Western Mediterranean) and "Rapport sur les Mesures Effectuées dans le Canal de Corse en Aout 1960" (Report on the Effective Measurements in the Corsican Channel in August 1960), by Jean Le Floch; "Les Causes de la Tempête du 1er Décembre 1959 dans la Région de Nice" (The Causes of the Storm of December 1, 1959, in the Region of Nice) and "Effet du Vent sur le Mouvement des Eaux Littorales" (Effect of Wind on the Movement of Coastal Waters), by V. Romanovsky.

OCEAN PERCH:

"O Mestnykh Stadakh Okunya-Klyuvacha Severnoi Atlantiki" (Local Schools of Sea Perch in the North Atlantic), by K. G. Konstantinov, article, *Rybnoe Khozaistvo*, vol. 38, no. 2, 1962, pp. 12-15, printed in Russian. VNIRO Glavniproekta, pri Gosplanie SSSR, Moscow, U. S. S. R.

OTOLITHS:

"Contribuciones al Conocimiento de los Otolitos de Peces Actuales" (Contributions to the Knowledge of the Otoliths of Recent Fishes), by Juan Bauza Rulian, article, *Boletín de la Real Sociedad Espanola Historia Natural*, vol. 59, no. 2, 1961, pp. 153-168, printed in Spanish. Real Sociedad Espanola Historia Natural, Madrid, Spain.

PANAMA:

Foreign Trade Regulations of Panama, OBR 63-119, 8 pp., printed, 15 cents, September 1963. Bureau of International Commerce, U. S. Department of Commerce, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.) The new Customs Tariff of 1957 has as its policy objectives the fostering of economic development through the protection of domestic industries. This is accomplished by the establishment of higher tariffs and the imposition of quotas on imports competing with domestic products. The report discusses the import tariff system sales and other internal taxes, documentation and fees, labeling and marking requirements, and special customs provisions. Also covers nontariff import trade controls, Panama's export controls, United States controls on foreign trade with Panama, and diplomatic representation between Panama and the United States.

PESTICIDES:

Pesticide Handbook 1962, by Donald E. H. Frear, 14th edition, 303 pp., printed. College Science Publishers, State College, Pa.

PHILIPPINES:

Fisheries Statistics of the Philippines, 1962, 105 pp., processed. Fisheries Economics and Statistics Section, Fisheries Research Division, Philippine Fisheries Commission, Department of Agriculture and Natural Resources, Quezon City, Philippines. A complete report covering all aspects of Philippine

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

fishery production during 1962, with some comparative data for previous years. The tables are grouped together under the headings (1) production, consumption, and requirement; (2) commercial fishing vessels; (3) fish ponds; (4) foreign trade; and (5) other data. Subdivisions of the tables is made according to gear, species caught, monthly production, and fishing grounds. The appendices include, among other items, information on the fishery districts, fishing grounds used by commercial vessels, and forms used in collecting statistics. Except for the table showing production data since 1950, most of the information covers the five-year period 1958-1962.

PHYSIOLOGY:

"Primenenie Sposoba Chebysheva k Metodike Rekonstruktsii Rosta Ryb po Cheshue" (The Use of Chebyshev's Method for Calculating the Growth of Fish from the Scales), by L. F. Shentyakova, article, *Trudy Inst. Biol. Vodokhranilishch Akad. Nauk SSSR*, vol. 4, no. 7, 1961, pp. 281-293, printed in Russian. Akademiya Nauk SSSR, Institut Biologicheskoi Fiziki. Vodokhraneniia, Moscow, U. S. S. R.

Theoretical Studies on Sea Animal Locomotion, by Julius Siekmann, *Engineering Progress at the University of Florida*, vol. 17, no. 7, 1963, Technical Paper No. 264, 48 pp., illus., printed. (Parts I and II reprinted from *Ingenieur-Archiv*, vol. 31, no. 3, 1962, and vol. 32, no. 1, 1963, respectively. Part III reprinted from the *Journal of Fluid Mechanics*, vol. 15, part 3, 1963.) Engineering and Industrial Experiment Station, University of Florida, Gainesville, Fla.

"Vliyaniye Fiziologicheskogo Sostoyaniya Ryb na Ikh Reaktsiyu na Svet" (Effect of the Physiological Condition of Fish (*Leucospus delineatus*) on Their Response to Light), by S. G. Zussner and R. M. Etingen, article, *Rybnoe Khoziaistvo*, vol. 11, 1961, pp. 19-21, printed in Russian. VNIRO Glavniproekta, pri Gosplanie SSSR, Moscow, U. S. S. R.

PLANKTON:

Behaviour of Plankton in Relation to Hydrographic Factors, by H. B. Moore, Final Report, 7 pp., printed, 1962. University of Miami, Marine Laboratory, 1 Rickenbacker Causeway, Miami 49, Fla.

Field Trials with the Clarke-Bumpus Plankton Sampler, by Lance Regan, Manuscript Report No. 16, 28 pp., illus., printed, 1963. University of British Columbia, Institute of Oceanography, Vancouver, B. C., Canada.

POLAND:

Budownictwo Okretowe, vol. VIII, no. 5, May 1963, 47 pp., illus., printed in Polish with English summaries. Wydawnictwa Czasopism Technicznych NOT, Warsaw, Czackiego 3/5, Poland. Includes articles on: "Kierunki Budownictwa Statkow Rybackich dla Polskiego Rybolowstwa" (Trends in the Fishing Boats Building for the Polish Fishery), by J. Swiecicki; "Swiatowa Produkcja Statkow Rybackich" (The World Production of Fishing Boats), by C. Wojewodka; "Okres Eksploatacji Nowych Typow Statkow Rybackich" (Operational Age of New Type Fishing Vessels), by M. Domagala; "Pomocnicza Flota Rybacka" (Auxiliary Fishing Boats), by J.

Staszewski; "Trawler-Zamrazalnica B 18" (Freezer-Trawler B 18 Type), by R. Roguski; "Trawler-Zamrazalnica 2,500 TDW" (Freezer-Trawler of 2,500 Tons D. W.), by W. Piltz; "Konceptcja Trawlera Dos-tawczego dla Wspolpracy z Baza-Przetwortnia" (Proposal for a Catcher to Co-Operate with a Factory-Ship), by Z. Tretkowski; "Nowoczesne Trawlery Ru-fowe dla Rybolowstwa" (Modern Stern Trawlers), by M. Gasiorowski; "Superkuter Stalowy B 25sT - Wersji Tropikalnej" (Large Steel Cutter B 25sT - Tropical Version), by Z. Foltyn; "Urzadzenie Tralowe Zastosowane na Trawlerze-Przetwortni m. t. 'Kas-tor'" (Trawling Arrangements as Fitted in Factory-Trawler m. t. "Kastor"), by W. Czajka; "Perspektywy Budowy Kadlobow Statkow Rybackich z Tworzyw Sztucznych" (Prospects of Building Fishing Boats Hulls of Glass Reinforced Plastics), by J. Kozlowski; "Nowoczesne Układy Napedowe Statkow Rybackich" (Modern Machinery Installations of Fishing Boats), by D. Bogucki; and "Analiza Pracy Urzadzen Elek-trycznych na Trawlerze Przetwortni" (The Work of Electrical Installations in a Factory-Trawler--Anal-ysis), by R. Szymanski.

Polish Shipbuilding Industry, 53 pp., illus., printed. Zjednoczenie Przemyslu Okretowego, Warsaw, ul. Krucza 36, Poland.

POLLUTION:

"Effects of Logging upon Fish Resources of the West Coast," by Donald W. Chapman, article, *Journal of Forestry*, vol. 60, no. 8, 1962, pp. 533-537, printed. Society of American Foresters, Mills Bldg., 17th St. and Pennsylvania Ave. NW., Washington, D. C. 20006.

The Growth and Survival of Fish in Some Suspensions of Solids of Industrial Origin, by D. W. M. Herbert, Reprint No. 427, 6 pp., printed, 1963. Water Pollution Research Laboratory, Stevenage, Herts., Eng-land.

Oxygen Relationships in Streams; Proceedings of a Seminar Sponsored by the Water Supply and Water Pollution Program of the Sanitary Engineering Center, October 30-November 1, 1957, 194 pp., printed, 1958. Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.

"Study of the Bio-Assay Method for the Evaluation of Water Pollution. II--Use of the Fertilized Eggs of Sea Urchins and Bivalves," by Katsuwo Okubo and Takako Okubo, article, *Bulletin of Tokai Regional Fisheries Research Laboratory*, no. 32, 1962, pp. 131-140, printed. Tokai Regional Fisheries Research Laboratory, Tsukushima, Chuo-ku, Tokyo, Japan.

Water Pollution Control, Sewage Treatment, Water Treatment--Selected Biological References, by Wil-liam M. Ingram and Kenneth M. Mackenthun, 148 pp., illus., printed, 70 cents, 1963. Division of Water Supply and Pollution Control, Public Health Service, U. S. Department of Health, Education, and Welfare, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Wash-ington, D. C. 20402.) Contains sections of biological references on water pollution control, sewage treat-ment, water treatment, industrial waste water, rec-reational water treatment, organism identification, and aspects of water quality. Includes a subsection on fish and shellfish in relation to water pollution control.

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

POLYUNSATURATED FATS:

"Production of Hypercholesterolemia and Atherosclerosis by a Diet Rich in Shellfish," by William E. Connor, Jay J. Rohwedder, and John C. Hoak, article, *Journal of Nutrition*, vol. 79, April 1963, pp. 443-450, printed. American Institute of Nutrition, 36th St. at Spruce, Philadelphia 4, Pa.

PRESERVATION:

"Fish Preservation Inquiries. II--Crayfish Handling Practices (5)," by A. R. Prater and W. A. Montgomery, article, *Fisheries Newsletter*, vol. 22, February 1963, p. 18, printed. Commonwealth Fisheries Office, Department of Primary Industry, Canberra, Australia.

"Fish Preservation Inquiries. III--Fisheries Products. Fish Sausages (1)," by W. A. Montgomery and A. R. Prater, article, *Fisheries Newsletter*, vol. 22, March 1963, p. 20, printed. Commonwealth Fisheries Office, Department of Primary Industry, Canberra, Australia.

"Preservation by Antibiotics and Penetrating Radiations. I and II," by H. L. A. Tarr, articles, *Fishing News International*, vol. 1, no. 1, 1961, pp. 17-20 and vol. 1, no. 2, 1962, pp. 46-48, respectively, illus., printed. A. J. Heighway Publications Ltd., 110 Fleet St., London EC4, England.

A Study of the Effects of Sub-Sterilization Doses of Radiation on the Storage Life Extension of Soft-Shell Clams and Haddock Fillets, by J. T. R. Nickerson, S. A. Goldblith, and E. B. Masurovsky, Quarterly Progress Report, November 1961-January 1962, 35 pp., printed. Massachusetts Institute of Technology, Cambridge, Mass.

The Temperature of British Fish during Distribution in Summer, by G. H. O. Burgess, Torry Technical Paper No. 1, 54 pp., printed, 1959. Torry Research Station, Aberdeen, Scotland.

PURSE SEINE:

Studies on the Mechanical Characters of Purse Seine in Relation to Its Fishing Efficiency, by Yunosuke Iitaka, 118 pp., illus., printed. Fisheries Institute, Faculty of Agriculture, Kinki University, Fufe City, Osaka Prefecture, Japan, December 1962. Deals specifically with the mechanical properties and behavior of a purse seine in working condition. The report is divided into four parts. In the first section, the origin, development, and present condition of the purse seine fisheries are traced. In the second part, the fundamental researches on the net are described. A simple current meter, the weight of webbing in water, the resistance of a plane net in a current are treated. The mechanical behavior of the purse seine in action is discussed in the third section. The results of a series of model experiments of purse seines are given and the theoretical analysis of sinking movement of the lead line is also introduced. The last section deals with the fishing capacities of purse seines.

QUALITY:

"Mechanical Properties of Fish and Fish Products," by J. J. Connell, article, *Flow Properties of Blood and Other Biological Systems*, pp. 316-326, illus.,

printed, 1960. Pergamon Press, 122 E. 55th St., New York 22, N. Y.

"Quality Evaluation Studies of Fish and Shellfish from Certain Northern European Waters," by Lionel Farber, article, *Food Technology*, vol. 17, April 1963, pp. 110-112, 113-114, printed. The Garrard Press, 510 N. Hickory St., Champaign, Ill.

RADIOACTIVE WASTES:

"Some Fundamental Aspects of Marine Ecology in Relation to Radioactive Wastes," by M. B. Schaefer, article, *Health Physics*, vol. 6, nos. 3/4, 1961, pp. 97-102, printed. Health Physics, 122 E. 55th St., New York 22, N. Y.

RADIOBIOLOGY:

Problems of Radiobiology. Vol. 2--Transactions of the Central Roentgenological and Radiological Institute of the Ministry of Health of the USSR, edited by M. N. Pobedinskii and P. N. Kiselev; Vol. 3--Collection of Papers in Honor of the 60th Anniversary of Professor M. N. Pobedinskii, by P. N. Kiselev, G. A. Gusterin, and A. I. Strashinin, OTS 61-31016; OTS 61-31017, 439 pp. and 341 pp., respectively, illus., processed, \$4.50 and \$3.50, respectively, 1962. (Translated from the Russian, Voprosy Radiobiologii.) Office of Technical Services, U.S. Department of Commerce, Washington, D. C. 20235.

REFRIGERATION:

"Recent Advances in Refrigerating Machinery Installations in Fishing Vessels," by M. B. F. Ranken, article, *Norwegian Fishing and Maritime News*, vol. 10, no. 3, 1963, pp. 10, 12, 14, 16-17, 19, 21, illus., printed. Norwegian Fishing and Maritime News, P. O. Box 740, Slottsgt. 3, Bergen, Norway.

ROCKFISH:

"O Morskome Okune Zaliva Alyaska" (Rockfish of the Gulf of Alaska), by T. G. Lyubimova, article, *Rybnoe Khoziaistvo*, vol. 9, 1961, pp. 27-30, printed in Russian, VNIRO Glavniproekta, pri Gosplanie SSSR, Moscow, U. S. S. R.

SAFETY:

"Air-Sea Rescue Devices," by J. Burgess, article, *Fishing News*, no. 2579, 1962, pp. 6-7, illus., printed. A. J. Heighway Publications Ltd., 110 Fleet St., London EC4, England.

SALMON:

"Baltic Salmon Fluctuations. 2--Porpoise and Salmon," by Arne Lindroth, article, *Institute of Freshwater Research Report No. 44*, pp. 105-112, printed. Institute of Freshwater Research, Drottningholm, Sweden, 1962.

A Comparative Survey of the Migratory Behaviour of Adult Salmon in Fish Control Devices, by D. V. Ellis, Manuscript Report Series (Biological) No. 749, 50 pp., printed, 1963. Fisheries Research Board of Canada, Biological Station, Nanaimo, B. C., Canada.

An Estimation of the Numbers of Mature and Immature Salmon in Herring Purse-Seine Catches from British Columbia Coastal Waters during the Winters of 1959, 1960 and 1961, by W. E. Barraclough and D. N. Outram, Manuscript Report Series (Biological) No. 753,

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

14 pp., printed, 1963. Fisheries Research Board of Canada, Biological Station, Nanaimo, B. C., Canada.

"Grey Seals as Competitors with Man for Salmon," by J. D. Lockie, article, *British Ecological Society Symposium*, no. 2, pp. 316-322, printed. Honorary Secretary, British Ecological Society, Osmington House, Osmington, Weymouth, Dorset, England, 1962.

"Izmenie Pishchevaritel'nogo Apparata Letnei Kety v Period Prednerestovogo Golodaniya" (Changes in the Digestive Tract of Chum Salmon during the Pre-spawning Fast), by V. P. Korzhenko, article, *Nauchnye Doklady Vyshey Shkoly Biologicheskies Nauki*, vol. 3, 1960, pp. 19-32, printed in Russian. Gosudarstvennoe Izdatel'stvo "Vysshaya Shkola," Pod-sosenskii Per. 20, Moscow B-62, U. S. S. R.

"Materialy po Vozrastu i Tempu Rosta Letnei Kety (Oncorhynchus keta Walbaum) Reki My" (Data on the Age and Growth Rate of the Chum Salmon, *Oncorhynchus keta* (Walbaum), of the My River), by A. A. Svetovidova, article, *Nauch. Doklady Vyshey Shkoly Biol. Nauk*, vol. 1, 1961, pp. 29-32, printed in Russian. Gosudarstvennoe Izdatel'stvo "Vysshaya Shkola," Pod-sosenskii Per. 20, Moscow B-62, U. S. S. R.

"Sravitel'naya Kharakteristika Vozrasta i Rosta Krasnoi (Oncorhynchus nerka Walb.) Kuril'skogo Ozero, Kamchatki i Bristol'skogo Zaliva Alyaski" (Comparative Age and Growth Characteristics of the Sockeye Salmon (*Oncorhynchus nerka* Walb.) of Lake Kuril, Kamchatka, and Bristol Bay, Alaska), by O. A. Mathisen, article, *Voprosy Ikhtiologii*, vol. 2, no. 1, 1962, pp. 42-54, printed in Russian. Akademiya Nauk SSSR, Ikhtiologicheskaya Komissiya, Moscow, U. S. S. R.

"Zavisimost' Vylupleniya Zarodyshei Losovykh i Sigovykh ot Nekotorykh Faktorov Sredy" (The Relationship between the Time of Hatching of Salmon and Whitefish Embryos and Certain Environmental Factors), by A. V. Popov and A. I. Zotin, article, *Rybnoe Khoziaistvo*, no. 11, 1961, pp. 22-28, printed in Russian. VNIRO Glavniy proekta, pri Gosplanie SSSR, Moscow, U. S. S. R.

SALMONIDS:

"Utbredningen av Furunkulos hos Fisk i Sverige under Aren 1951-1960" (Outbreaks of Fish Furunculosis in Salmonids in Sweden 1951-1960), by J. Lange and O. Ljungberg, article, *Nordisk Veterinaermed.* vol. 14, no. 3, 1962, pp. 177-191, printed in Swedish. Statens Veterinarmedicinska Anstalt, Stockholm, Sweden.

SARDINES:

Fecundidad de la Sardina Europea (SARDINA PIL-CHARDUS Walb.) (Fecundity of the European Sardine--*Sardina pilchardus* Walb.), by Buenaventura Andreu, 26 pp., illus., printed in Portuguese. (Reprinted from *Publicacoes do XXVI Congresso Luso-Espanhol*, vol. I.) Associacao Portuguesa para o Progresso das Ciencias, Porto, Portugal, 1962.

SCALLOPS:

"Reproduction of the Bay Scallop, *Aequipecten irradians* Lamarck. Influence of Temperature on Maturation and Spawning," by A. N. Sastry, article, *The Biological Bulletin*, vol. 125, no. 1, August 1963, pp. 146-153, printed, single copy \$2.50. The Biological Bulletin, Marine Biological Laboratory, Woods Hole, Mass.

SCOMBROIDS:

"Body Form and Swimming Performance in the Scombroid Fishes," by Vladimir Walters, article, *American Zoologist*, vol. 2, no. 2, 1962, pp. 143-149, printed. American Society of Zoologists, 104 Liberty St., Utica, N. Y.

SEA LAMPREY:

"The Histology of Tail Regeneration in the Ammocoetes," by I. A. Niazi, article, *Canadian Journal of Zoology*, vol. 41, no. 1, 1962, pp. 125-146, printed. Division of Administration, National Research Council, Sussex St., Ottawa 52, Canada.

SEA OTTER:

"Recovery of a Fur Bearer," by Karl W. Kenyon, article, *Natural History*, vol. LXXII, no. 9, November 1963, pp. 12-21, illus., printed, single copy 50 cents. The American Museum of Natural History, Central Park W. at 79th St., New York 24, N. Y. Discusses life history, anatomy, reproduction, tagging, and near extinction of the sea otter.

SEAWEED:

British Seaweeds, by Carola I. Dickinson, 244 pp., illus., printed, 25s. (about US\$3.50). Eyre and Spottiswoode Ltd., 15-16 Bedford St., Strand, London WC2, England, 1963.

"Drying of Seaweeds and Other Plants. V--Through-Circulation Drying of *Ascophyllum nodosum* in a Semi-Continuous Drier," by J. H. Merritt and E. Gordon Young, article, *Journal of the Science of Food and Agriculture*, vol. 14, January 1963, pp. 39-42, printed. Society of Chemical Industry, 14 Belgrave Sq., London SW1, England.

SEROLOGY:

"A Simple Technique for Immobilizing Fish to Remove Blood," by Jack D. Burke, article, *Copeia*, no. 4, 1962, pp. 852-854, printed. American Society of Ichthyologists and Herpetologists, 18111 Nordhoff St., Northridge, Calif.

SHARKS:

"The Behavior of Sharks," by P. W. Gilbert, article, *Scientific American*, vol. 207, no. 1, 1962, pp. 60-68, illus., printed. Scientific American Inc., 415 Madison Ave., New York 17, N. Y.

Shark for Sale, by William Travis, 175 pp., illus., printed, 1961. Rand McNally and Company, 536 S. Clark St., Chicago 5, Ill.

SHRIMP:

"Effect of Salinity on Growth of Postlarval Penaeid Shrimp," by Zoula P. Zein-Eldin, article, *The Biological Bulletin*, vol. 125, no. 1, August 1963, pp. 188-

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

196, illus., printed, single copy \$2.50. The Biological Bulletin, Marine Biological Laboratory, Woods Hole, Mass.

"The Proper Zoological Name of the North American White Shrimp," by Gordon Gunter, 8 pp., printed. (Reprinted from Proceedings of the Gulf and Caribbean Fisheries Institute, Fifteenth Annual Session, November 1962, pp. 103-110.) Gulf and Caribbean Fisheries Institute, University of Miami, Marine Laboratory, 1 Rickenbacker Causeway, Miami 49, Fla.

"Research and Shrimp Production," by Lyle S. St. Amant, article, Louisiana Conservationist, vol. 15, nos. 11 and 12, November-December 1963, pp. 6-9, illus., printed. Louisiana Conservationist, Wildlife and Fisheries Bldg., 400 Royal St., New Orleans 16, La. Recent declines in shrimp production in the northern Gulf of Mexico have resulted in a great impetus in shrimp research by state and federal agencies. During the past 3 years shrimp research in that area has been coordinated and carried out by those agencies at a level which for the first time has made adequate data available in time to apply to each year's production. These data are now being applied annually in the prediction of the shrimp harvest, the setting of seasons, and the general management of the shrimp population. This article attempts to place research in its proper perspective and examines what may be expected from the application of research in the shrimp industry in the near and distant future.

SMALL BUSINESS MANAGEMENT:

Bringing Management Information to Small Business, by J. Richard Stevens, Management Research Summary, 4 pp., processed. Small Business Administration, Washington, D. C. 20416. A major block to greater success for many small businessmen is failure to make use of the management information that is available. There are many sources of good management information and counsel. Major problems are (1) to present the material in such a form that the small businessman can and will use it, and (2) to develop channels through which the small businessman can find the help he needs when he needs it. Agencies that originate and communicate business information, the report suggests, should coordinate their efforts in order to reduce the avalanche of duplicate and overlapping materials. Effort should be made to provide local personal sources of management information and counsel.

Environment vs. Management in Small Business Failure, Management Research Summary, 2 pp., processed, 1963. Small Business Administration, Washington, D. C. 20416. Environmental rather than managerial factors were dominant in the termination of 20 of the 37 out-of-business firms studied. Some environmental factors were economic decline of the industry in that area and unavailability of financing. The most noticeable difference between successful and unsuccessful owners lay in their approach to decision making. In general, owner-managers of the out-of-business firms had relied less on outside management and technical help than had owner-managers of the firms that were still active.

Keeping Score with Effective Records, by William L. Raby, Small Marketers Aid No. 94, 4 pp., processed. Small Business Administration, Washington, D. C. 20416, August 1963. Designed for small marketers who may wish to check their records. To be effective, records should provide needed facts at the proper time, and they should be easy to handle. The kinds of records and how many depend on the nature of the particular business. Types of records often used by small marketers include inventory and purchasing, sales records, cash records, credit records, personnel records, fixtures and property, and bookkeeping.

Profitability and Size of Firm, by H. O. Stekler, Management Research Summary, 2 pp., processed, 1963. Small Business Administration, Washington, D. C. 20416. Findings showed that small firms generally have lower profit ratios than large firms. The report concludes that small firms as a group have less ability to expand than large firms. The profit ratios of the small firms, however, are not excessively low in comparison with industry averages. Small firms showed more variation than large ones in the profit ratios of firms within a size class.

Tax Guide for Small Business, 1964, 144 pp., printed, 40 cents, December 1963. Internal Revenue Service, U. S. Department of the Treasury, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.) For use in filing the 1963 income tax returns, excise tax returns, and other returns. It answers the Federal tax questions of corporations, partnerships, and sole proprietorships. Explains in plain layman's language the tax results from buying, starting, operating, and the sale and other disposition of a business. In addition, contains a tax calendar for 1964 which should prove helpful to the businessman throughout the year, since it indicates what he should do and when he should do it in regard to the various Federal taxes. Also has a checklist of special interest for the man just starting in business in that it affords a quick method for determining for what Federal taxes he may be liable.

Trends and Prospects for Affiliated Food Retailers, by Russell L. Childress, 168 pp., printed, \$2. Department of Agricultural Economics, University of Delaware, Newark, Del., 1962.

Will Profit Sharing Help Your Firm?, by B. L. Metzger, Management Aid for Small Manufacturers No. 157, 4 pp., processed, October 1963. Small Business Administration, Washington, D. C. 20416. Small companies are finding that profit sharing, when properly handled, provides incentives which can help to bring about employee teamwork, reduced labor turnover, high productivity, better product quality, and lower costs. These results are achieved because profit sharing programs "share the caring" by giving employees a stake in the company's success. Yet the success of a profit-sharing program is not automatic. It depends on many factors, including the company's profit potential, a plan tailored to the company's needs, and keeping employees interested.

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

SMOKING:

Recommendations for the Preparation of Smoked Salmon, by A. Bannerman, Torry Advisory Note No. 5, 3 pp., printed, 1962. Torry Research Station, Aberdeen, Scotland.

Smoked White Fish--Recommended Practice for Producers, Torry Advisory Note No. 9, 7 pp., printed, 1963. Torry Research Station, Aberdeen, Scotland.

SOUTH AFRICA REPUBLIC:

Thirty-First Annual Report for the Period 1st April, 1959 to 31st March, 1960, 242 pp., printed, 1963. Division of Sea Fisheries, Department of Commerce and Industries, Pretoria, South Africa Republic.

SPAIN:

Las Conservas de Pescado Espanolas ante el Mercado Comun (The Spanish Canned Fish Industry and the Common Market), by Francisco Lopez Capont, 7 pp., printed in Spanish. (Reprinted from *Informacion Conservera*, no. 111-112, March-April 1963.) *Informacion Conservera*, Colon, 62, Valencia, Spain.

"Glance at Some Spanish Fishing Methods," by G. Christian, article, *Fishing News International*, vol. 2, no. 3, July-September 1963, pp. 299-300, 302-303, illus., printed, single copy 6s. 6d. (about 85 U. S. cents). Arthur J. Heighway Publications Ltd., Ludgate House, 110 Fleet St., London EC4, England. Discusses long-line fishing, trammel net fishing, and ring net fishing as practiced by Spanish fishermen in the province of Catalonia.

SPAWNING:

"Izmenenie Polovykh Tsiklov u Ryb s Edinovremennym Ikrometaniem v Svyazi s Izmeneniem Uslovii Sushchestvovaniya" (Change of the Sexual Cycle of Fishes Having a Single Spawning Time (Each Year) Associated with Changed Conditions of Existence), by B. V. Koshelev, article, *Voprosy Ikhtiologii*, vol. 1, no. 4, 1961, pp. 716-724, printed in Russian. Akademiya Nauk SSSR, Ikhtiologicheskaya Komissiya, Moscow, U. S. S. R.

SPOILAGE:

"The Effect of Tylosin on Coagulase-Positive Staphylococci in Food Products," by R. A. Greenberg and J. H. Sillicker, article, *Journal of Food Science*, vol. 27, no. 1, 1962, pp. 60-63, printed. Institute of Food Technologists, 510-522 N. Hickory St., Champaign, Ill.

SPORT FISHERY:

"Valuation of a Fishery," by James A. Crutchfield, article, *Transactions of the Twenty-Seventh North American Wildlife and Natural Resources Conference*, pp. 335-347, printed. Wildlife Management Institute, Wire Bldg., Washington 5, D. C., 1962.

SQUID:

"A New Species of Gonatid Squid from the Northeastern Pacific," by William G. Pearcy and Gilbert L. Voss, Contribution No. 466, 7 pp., illus., printed. (Reprinted from *Proceedings of the Biological Society of Washington*, vol. 76, August 2, 1963, pp. 105-112.) University of Miami, Marine Laboratory, Institute of Marine Science, 1 Rickenbacker Causeway, Miami 49, Fla.

STERN TRAWLERS:

"Brunswick Type Stern Trawler," article, *Canadian Fisherman*, vol. 49, no. 5, 1962, pp. 15-17, illus., printed. National Business Publications Ltd., Gardenvale, Que., Canada.

"French Yard Claims Improved Stern Trawler Arrangement," article, *World Fishing*, vol. 11, no. 5, 1962, p. 55, illus., printed. John Trundell & Partners, Ltd., St. Richards House, Eversholt St., London NW1, England.

"Stern Trawler with Ferry-Type Bridge," article, *World Fishing*, vol. 11, no. 11, 1962, pp. 40, 43, illus., printed. John Trundell & Partners, Ltd., St. Richards House, Eversholt St., London NW1, England.

STRIPED BASS:

"Resultats d'Etiquetage du Bar d'Amerique, dans le Fleuve Saint Laurent de 1945 a 1960" (Results of Tagging Striped Bass in the Saint Lawrence River during the Period 1945 to 1960), by G. Beaulieu, article, *Naturaliste Canadien*, vol. 89, no. 8/9, 1962, pp. 217-236, printed in French. *Naturaliste Canadien*, l'Universite Laval, Quebec, Canada.

SWEDEN:

"Vastkustfiskarna Begar att fa Behalla sin Olycksfallsforsakring; Uppvaktning infor Yrkesskadeutredningen" (The Fishermen of the West Coast Demand to Keep Their Accident Insurance; a Delegation before the Work-Hazards Investigating Group), by Ingemar Gerhard, article, *Svenska Vastkust Fiskaren*, vol. 33, no. 16, August 1963, p. 388, printed in Swedish. Svenska Vastkustfiskarnas Centralforbund, Goteborg, Sweden.

TAGGING:

"Zavisimost' Sokhrannosti Metok ot Povedeniya i Uslovii Obitaniya Ryb." (The Relation of Retention of Tags to the Behavior and Environmental Conditions of Fishes), by K. R. Fortunatova and N. I. Chugunova, article, *Voprosy Ikhtiologii*, no. 15, 1960, pp. 91-105, printed in Russian. Akademiya Nauk SSSR, Ikhtiologicheskaya Komissiya, Moscow, U. S. S. R.

TARIFF AND TRADE:

Negotiations under the Trade Expansion Act of 1962, Publications 63-1, 30 pp., processed, 20 cents, October 1963. Office of the Special Representative for Trade Negotiations, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.) Contains "Notice of Proposed Trade Agreement Negotiations and Articles to be Considered for Negotiation;" and "Notice of Public Hearings: Trade Information Committee."

Public Notice of Investigation and Hearings (Investigation No. TEA-221 (b)-1 Under Section 221 of the Trade Expansion Act of 1962, With Respect to President's List of Articles for Possible Consideration in Trade Agreement Negotiations), 6 pp., processed, October 22, 1963. U. S. Tariff Commission, Washington, D. C. 20436. Included in requests for reservation of certain items from negotiations are cod, cusk, haddock, hake, pollock, Atlantic ocean perch, "otherwise processed."

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

TARIFFS:

Tariff Schedules of the United States Effective August 31, 1963, TC Publication 112, 532 pp., processed, \$4 (includes cost of supplemental pages to be issued until further notice), 1963. United States Tariff Commission, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.) Presents a republication of the legal text of the Tariff Schedules of the United States and of the related material originally published by the President in Part II of the Federal Register of August 17, 1963. Also includes the text of Proclamation 3548 which brought the new schedules into effect on August 31, 1963; the Tariff Classification Act of 1962, as amended; and a special list of rates of duty regarded as "existing on July 1, 1962," under section 256 (4) of the Trade Expansion Act of 1962. Included in the volume is a schedule of duties on fish and shell fish.

THAILAND:

"Chilling of Fish in Thailand," by M. C. Kosolsuriyathit Suriyong, P. Nitayachin, and G. N. Subba Rao, article, Current Affairs Bulletin, no. 37, August 1963, pp. 19-25, illus., printed. Indo-Pacific Fisheries Council, Food and Agriculture Organization of the United Nations, Bangkok, Thailand.

TILAPIA:

"The African Cichlid, *Tilapia heudeloti* Dumeril, in the Commercial Fish Catch of Florida," by Victor G. Springer and John H. Finucane, 2 pp., printed. (Reprinted from Transactions of the American Fisheries Society, vol. 92, no. 3, July 1963, pp. 317-318.) Secretary, American Fisheries Society, P. O. Box 483, McLean, Va.

TRANSPORTATION:

Road Transport of Frozen Fish, D. L. Nicol, Torry Advisory Note No. 8, 5 pp., printed, 1963. Torry Research Station, Aberdeen, Scotland.

TRAWLING:

"Einige Grundlagen für die Berechnung der Bewegung des Trawlers mit dem Schleppnetz" (Some Fundamentals for the Calculation of the Motion of a Trawler with the Trawl Gear), by H. Stengel, article, Fischereiforschung, vol. 5, no. 3, 1962, pp. 10-14, illus., printed in German. Institut für Hochseefischerei und Fischverarbeitung, Rostock-Marienehe, Germany.

"Midwater Trawling," by A. von Brandt, article, Fishing News International, vol. 1, no. 2, 1962, pp. 63-65, illus., printed. A. J. Heighway Publications Ltd., 110 Fleet St., London EC4, England.

"Die Optimale Schleppgeschwindigkeit" (The Optimum Towing Speed), by V. N. Cestnoj, article, Fischereiforschung, vol. 5, no. 2, 1962, pp. 16-19, illus., printed in German. Institut für Hochseefischerei und Fischverarbeitung, Rostock-Marienehe, Germany.

TRAWLS:

"Du Chalut de Fond a Grande Ouverture Verticale au Chalut Flottant" (From a Bottom Trawl with Large Vertical Opening to the Floating Trawl), by C. Ne-

delec, article, Science et Peche, no. 95, 1961, 13 pp., illus., printed in French. Institut Scientifique et Technique des Peches Maritimes, 59 Ave. Raymond-Poincare, Paris XVI, France.

Trawls, by Zbigniew Zebrowski, OTS 60-21500, 109 pp., illus., printed, \$1.50, 1963. (Translated from the Polish, Wloki Trawlarowe, 1954.) Office of Technical Services, U. S. Department of Commerce, Washington, D. C. 20235.

TROUT:

"He's Forever Chasing Rainbows," by Frank J. Taylor, article, The Saturday Evening Post, vol. 236, no. 42, November 30, 1963, pp. 70-71, illus., printed, single copy 20 cents. The Curtis Publishing Company, Philadelphia, Pa., 19105. Discusses a large trout farm in Idaho and how it was developed. A striking fact is that this is the most productive acreage on earth. Where an acre of dirt farm may produce a yearly harvest of 2,000 pounds of poultry or 500 pounds of beef, each acre of this farm yields 400,000 pounds of rainbow trout (weight based on fish dressed, packed, and ready for the market). In breeding the fish, the owner has eliminated the migratory pattern, extended the spawning period from 3 to 9 months, and developed trout that spawn at the age of 2 rather than 3 years. Fed on a mixture of fish meal, brewer's yeast, whey, soybean and alfalfa meal, and vitamins and minerals, the trout grow an inch a month. The use of a fish-cleaning machine in the packing plant has increased the production output. In 10 years, annual production has risen from 250,000 pounds to 1.5 million pounds. Recent innovations are the development of a mutation golden trout and plans for sale of live trout in West Coast food stores.

"A Contribution to the Growth and Food Biology of the Brown Trout *Salmo trutta* Trutta M. Fario and *Salmo trutta* Labrax M. Fario in Some Waters of Czechoslovakia," by Stanislav Frank, article, Vestník Československé Společnosti Zoologické, vol. 26, no. 4, 1962, pp. 316-328, printed in Czechoslovak. Department of Zoology, Laboratory of Ichthyology, Charles University, Prague, Czechoslovakia.

"Preliminary Research on the Action of Alkylaryl-sulphonate on *Salmo irideus*," by C. Maldura, article, Proceedings of the General Fisheries Council for the Mediterranean, no. 6, 1961, pp. 203-206, printed. General Fisheries Council for the Mediterranean, Food and Agriculture Organization of the United Nations, Viale delle Terme di Caracalla, Rome, Italy.

"On the Rainbow Trout (*Salmo gairdneri* Irideus) in Lake Titicaca, South America," by Yoshiichi Matsui, article, Bulletin of the Japanese Society of Scientific Fisheries, vol. 28, no. 5, 1962, pp. 497-498, printed. Japanese Society of Scientific Fisheries, Shiba-Kai-gondori 6, Minato-ku, Tokyo, Japan.

"Thermoperiodism in Sea-Run Cutthroat Trout (*Salmo clarki* Clarki)," by Wallace G. Heath, article, Science, vol. 142, no. 3591, October 25, 1963, pp. 486-488, illus., printed, single copy 35 cents. American Association for the Advancement of Science, 1515 Massachusetts Ave, NW., Washington 5, D. C.

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

Trout Stream Management in Massachusetts, by James W. Mullan, 94 pp., illus., printed. Massachusetts Division of Fisheries and Game, Boston, Mass., 1960.

TUNA:

"On the Blood Types of Yellowfin and Bigeye Tuna," by Akimi Suzuki, article, *American Naturalist*, vol. 96, no. 889, 1962, pp. 239-246, printed. The Science Press, Lancaster, Pa.

"Sobre as Pescarias de Atuns e Afins e Suas Areas de Ocorrencia no Atlantico Tropical no Bienio 1961-1962" (On the Fisheries for Tuna and Related Species and Their Areas of Occurrence in the Tropical Atlantic in the Bienium 1961-1962), by J. B. Gomes da Fonseca and Aldemir C. Barros, article, *Sudene, Boletim de Estudos de Pesca*, vol. 13, no. 7, July 1963, pp. 18-25, processed in Portuguese. Departamento de Industrializacao, Seter Pesca, Superintendencia do Desenvolvimento do Nordeste, Edificio Juscelino Kubitschek, 12^o Andar, Recife, Brazil.

Statistical Research Report on the Tuna Longline Fisheries, by Fishing Grounds, April 1961-March 1962, 103 pp., illus., processed in Japanese with English summary, August 1963. Statistics and Survey Division, Ministry of Agriculture and Forestry, Japanese Government, Tokyo, Japan. Discusses recent production trends in tuna long-line fishery; types of fishery and catch by ocean; operation and catch by area; and productivity. Includes statistical tables giving data on tuna long-line fishery catch by year and by type of fishery; number of vessels; composition of catch by area and by species; productivity by vessel size of Japan-based fishery; productivity by ocean by vessels in the 200-500 ton class; and other similar data.

"Studies of the Erythrocyte Antigens of the Skipjack Tuna (*Katsuwonus pelamis*)," by Lucian M. Sprague, article, *American Naturalist*, vol. 96, no. 889, 1962, pp. 233-238, printed. The Science Press, Lancaster, Pa.

Subsides pour l'Etude de l' "Honeycombing" de la Chair de Thon (Subsidies for the Study of "Honeycombing" of Tuna Meat), by Manuel de sa Nogueira, 45 pp., illus., printed in French. Ministerio da Economia, Secretaria de Estado do Comercio, Instituto Portugues de Conservas de Peixe, Lisbon, Portugal, 1959.

"Treasure on the Table," article, *Good Packaging*, vol. 24, no. 7, July 1963, Yearbook Edition, pp. 56-76, illus., printed, single copy 75 cents. Good Packaging, 171 Second St., San Francisco 5, Calif. A survey of the United States tuna industry, from sea to table. Discusses the history of the tuna fishery in Greece and Peru; the principal tuna species--albacore, bluefin, skipjack, and yellowfin; methods of catching tuna; processing and canning; tuna research; and marketing and consumption.

"The Tuna Fishery: Methods, Distribution, and Abundance," by G. V. Howard, article, *Western Fisheries*, vol. 64, no. 3, 1962, pp. 15-16, 50-53, 56-57, illus., printed. Roy Wrigley Publications Ltd., 1104 Hornby St., Vancouver 1, B. C., Canada.

TURKEY:

Balik ve Balikcilik, vol. XI, no. 10, October 1963, 35 pp., illus., printed in Turkish with English table of contents. Et ve Balik Kurumu G. M., Balikcilik Mudurlugu, Besiktas, Istanbul, Turkey. Includes, among others, articles on: "Fish Pigments" and "Basic Researches on the Development of Fishery in Turkish Freshwater Lakes and Dams."

Balik ve Balikcilik, vol. XI, no. 9, September 1963, 35 pp., illus., printed in Turkish with English table of contents. Et ve Balik Kurumu G. M., Balikcilik Mudurlugu, Besiktas, Istanbul, Turkey. Includes, among others, these articles: "The Fishing of Bonitos and Skipjacks by Hook and Line in the Territorial Waters (Part 2);" and "The Sulphurization and Sulphonation Methods of Fish Oil and Utilization of Raw Material of Fish Oil in Industry."

UNDERWATER EXPLOSIONS:

Geophysical Offshore Oil Explorations and Associated Fishery Problems, by R. L. Rulifson and R. W. Schoning, Investigational Report No. 1, 46 pp., printed, 1963. Oregon Fish Commission, Portland, Oreg.

UNDERWATER OBSERVATIONS:

"A Self-Contained Portable Tape Recording System for Use by SCUBA Divers," by Lloyd R. Breslau, John M. Zeigler, and David M. Owen, article, *Bulletin de l'Institut Oceanographique*, no. 1235, 1962, pp. 1-4, printed. Institut de l'Institut Oceanographique, Monaco-Ville, Monaco.

Undersea Photography in Marine Research, by R. E. Craig and R. Priestly, 1963 Marine Research No. 1, 27 pp., illus., printed, 15s. (about US\$2.10), 1963. Her Majesty's Stationary Office, 13A Castle St., Edinburgh 2, Scotland.

Underwater Photography, by Hilbert Schank and Harry Kendall, illus., printed. Camera Shop of the Maritimes Ltd., Halifax, N. S., Canada.

U. S. S. R.:

"Biologicheskie Rybokhozyaistvennye Issledovaniya v Sibiri" (Biological Fishery Research in Siberia), by B. G. Ioganzen, article, *Voprosy Ikhtiologii*, vol. 2, no. 1, 1962, pp. 3-17, printed in Russian. Akademia Nauk SSSR, Ikhtiologicheskaya Komissiya, Moscow, U. S. S. R.

"Fish Culture in the U. S. S. R.," by Michael M. Ovchynnyk, article, *Fishing News International*, vol. 2, no. 3, July-September 1963, pp. 279-282, printed, single copy 6s. 6d. (about 8s. J. S. cents). Arthur J. Heighway Publications Ltd., Ludgate House, 110 Fleet St., London EC4, England. The vast territory of the U. S. S. R. includes inland seas, about 25 million hectares of big and small lakes, about 4 million hectares of reservoirs, more than 3 million kilometers of rivers suitable for fishing, and more than 400,000 hectares of ponds suitable for fish culture. The Soviet authority announced that in 1962 about 800,000 metric tons of fish would be obtained from inland waters and that this amount will increase each year.

Fishing Economy 1962, Vol. 38, No. 6: (Selected) Translations, OTS 63-21982, 24 pp., processed, 75 cents, June 5, 1963. (Translated from the Russian,

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

Rybnoe Khoziaistvo, vol. 38, no. 6, 1962, pp. 3-7, 15-23.) Office of Technical Services, U. S. Department of Commerce, Washington, D. C., 20235.

"Teoriya Rybnogo Khoziaistva Kak Razdel Biotekhnii i ee Polozhenie v Sisteme Nauk v Svyazi s Problemoi Gidrostroitel'stva" (The Theoretical Basis of the Fishing Industry as a Division of Biotechnics and Its Position in the Scientific System in Relation to the Problem of Hydroelectrical Construction), by T. B. Berlyand, article, *Byull. Nauch.-Tekh. Inform. Vsesoyuz. Proektno-Izyskat. Nauch.-Issledovatel. Inst. "Godroproekt."*, vol. 13, 1961, pp. 24-33, printed in Russian. Vsesoiuznyi Proektno-Izyskatselskii Nauchnyi Issledovatel'skii Institut, Moscow, U. S. S. R.

UTAH:

"Bibliography of Utah Aquatic Biology, No. II," by Earl M. Christensen, article, *The Great Basin Naturalist*, vol. XXII, nos. 1-3, 1962, pp. 32-53, printed. Department of Botany, Brigham Young University, Provo, Utah.

VESSELS:

Merchant Vessels of the United States, 1963 (Including Yachts), 1,224 pp., processed, \$7. Bureau of Customs, U. S. Treasury Department, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.) Covers every American merchant vessel and yacht (including fishing vessels) which had an uncanceled document (register, enrollment and license, or license) on January 1, 1963. The official number, signal and radio-call letters, type of rig, name, tonnage, dimensions, place and date built, name of owner, and home port of every vessel are provided.

Small Boat Construction, by Robert M. Steward, printed, 1958. Rudder Publishing Co., 9 Murray St., New York 7, N. Y.

Small Seagoing Craft and Vessels for Inland Navigation; a Treatise on the Design and Construction of Ships and Boats Engaged in Inland Navigation, Coast- ing Trade, Passenger- and Ferry-Services, Towing, Icebreaking, and Sea Fishing, by A. Roorda, 568 pp., illus., printed, 1957. Technical Publishing Co., Haarlem, Netherlands.

WASHINGTON:

Natural Resources of Washington, 75 pp., illus., printed, 50 cents. Division of Information, Office of the Secretary, U. S. Department of the Interior, Washington, D. C., 1963. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.) Discusses early exploration and settlement, physical characteristics, park and recreational resources, water and power resources, fish and wildlife resources, mineral resources, land resources, indian tribes, and geologic history. Also covers programs of Federal natural resource agencies -- Bureau of Reclamation, Bonneville Power Administration, U. S. Army Corps of Engineers, Geological Survey, Bureau of Mines, Bureau of Indian Affairs, Bureau of Land Management, U. S. Forest Service, Fish and Wildlife Serv-

ice, National Park Service, and Bureau of Outdoor Recreation.

WHALES:

Bionics and Cetaceans, by A. C. Tomilin, OTS 63-13833, 3 pp., processed, January 10, 1963. (Translated from the Russian, *Trans. of Priroda*, vol. 51, no. 10, 1962, pp. 101-103.) Office of Technical Services, U. S. Department of Commerce, Independence Ave. and Ohio Dr. SW., Washington, D. C. 20235.

Ovulation Counts and Their Relation to Age and Stock Assessment in Female Fin Whales from British Columbia, by Gordon C. Pike, Manuscript Report Series (Biological) No. 752, 26 pp., printed, 1963. Fisheries Research Board of Canada, Biological Station, Nanaimo, B. C., Canada.

"Vitamin A Toxicity in Whale Liver," article, *Nutrition Reviews*, vol. 19, no. 10, 1961, pp. 318-319, printed. The Nutrition Foundation Inc., 99 Park Ave., New York 16, N. Y.

WHITEFISH:

"Life History of Whitefish Young (*Coregonus*) in Two Lake Reservoirs," by Thorolf Lindstrom, article, *Institute of Freshwater Research Report No. 44*, pp. 113-144, printed. Institute of Freshwater Research, Drottningholm, Sweden, 1962.

"The Tale of the Whitefish," by Russell McKee, article, *Michigan Conservation*, vol. XXXII, no. 5, September-October 1963, pp. 36-39, illus., printed. Michigan Conservation, Lansing 26, Mich. Whitefish numbers are again increasing in the Great Lakes. Two factors appear to be working in favor of this species: the sea lamprey may well be drastically reduced in the Upper Great Lakes by special control measures now in effect; and the record for the past 50 years indicates that whitefish may be ready for a surge in population within the next few years.

WHITE SUCKERS:

"Homing Tendency of Spawning White Suckers in Many Point Lake, Minnesota," by Donald E. Olson and Warren J. Scidmore, article, *Transactions of the American Fisheries Society*, vol. 92, no. 1, 1963, pp. 13-16, printed. Secretary, American Fisheries Society, P. O. Box 483, McLean, Va.

WORLD FISHERIES:

"Science and the Future of World Fisheries," by G. L. Kesteven, article, *Fishing News International*, vol. 2, no. 3, July-September 1963, pp. 289, 293, 295-296, printed, single copy 6s. 6d. (about 85 U. S. cents). Arthur J. Heighway Publications Ltd., Ludgate House, 110 Fleet St., London EC4, England. The author advances the view that stocktaking of fishery resources and fishery industries should be accelerated, and developed under international auspices. He believes that this work should be sponsored and organized by FAO's new resources' committee for which membership should be drawn from the existing fishery councils and commissions. The work in this stock-taking should be carried out largely by the councils and commissions which now provide a pattern covering the greater part of the earth's surface and its resources.

LENTEN PROMOTION, FEBRUARY 12-MARCH 29



Halibut Steaks Brazilian.



- 2 pounds halibut steaks or other fish steaks, fresh or frozen
- 2 tablespoons instant coffee
- 2 tablespoons lemon juice

- $\frac{1}{2}$ cup melted fat or oil
- 1 teaspoon salt
- 1 teaspoon onion salt
- Chopped parsley

Thaw frozen steaks. Place in a shallow baking dish. Dissolve coffee in lemon juice. Add remaining ingredients except parsley; mix thoroughly. Pour sauce over fish and let stand for 30 minutes, turning once. Remove fish, reserving sauce. Place fish on a well-greased broiler pan and brush with sauce. Broil about 3 inches from source of heat for 4 to 5 minutes. Turn carefully and brush with remaining sauce. Broil 4 to 5 minutes longer or until fish flakes easily when tested with a fork. Garnish with chopped parsley. Serves 6.

Halibut from the Pacific Northwest takes on a Latin flavor subtly complimented with the tangy zip of lemon and the warm freshness of coffee. Easy elegance, combined with already-on-the-shelf ingredients, will make this handy entree a popular favorite at your dinner table.

--From Fisheries Marketing Bulletin: "Protein Treasure from the Seven Seas."
Issued by the National Marketing Services Office,
U. S. Bureau of Commercial Fisheries, Chicago 5, Ill.

E

ME

ss."
ce,
III.